FACULTY OF TECHNOLOGY

U-Pb zircon dating of metasedimentary rocks within the Ikkari gold deposit, Central Lapland belt, northern Finland

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MASTER’S PROGRAMME IN GEOSCIENCE

Master’s thesis

2022

TIIVISTELMÄ OPINNÄYTETYÖSTÄ

Tutkimusyksikkö	**Tutkinto-ohjelma**
Oulun yliopisto teknillinen tiedekunta	Geologian ja mineralogian koulutusohjelma
Tekijän nimi	**Työn ohjaaja yliopistolla**
Harju, Samuli Aleksi	Ranta, Jukka-Pekka

Työn nimi

U-Pb ikämääritys Ikkarin kultaesiintymän metasedimenttikivien zirkoneista, Keski-Lapin vyöhykkeellä, Pohjois-Suomessa

Opintosuunta	**Työn laji**	**Aika**	**Sivumäärä**
Geotieteet	Pro Gradu	Joulukuu 2022	41 s., 3 liitettä

Tiivistelmä

Ikkarin kultaesiintymä sijaitsee Keski-Lapin vyöhykkeellä, lähellä Jeesiön ja Rajalan kyliä. Keski-Lapin vyöhyke koostuu kuudesta stratigrafisesta yksiköstä, vanhimmasta nuorimpaan Sallan ryhmä, Kuusamon ryhmä, Sodankylän ryhmä, Savukosken ryhmä, Kittilän sviitti ja Kummun ryhmä. Tutkimuksen tarkoituksena oli selvittää, Ikkarin metasedimenttien ikäjakauma ja mihin stratigrafiseen yksikköön ne kuuluvat. Ikämääritykset tehtiin metasedimenteissä olevista detritaalisista zirkoneista zirkon U-Pb menetelmän avulla ja näitä ikämääritystuloksia vertailemalla muihin julkaisuihin. Petrografisissa tutkimuksissa tutkittiin ohuthieistä näytteiden mineraalikoostumus ja kivilaji.

Kaksi näytteistä on konglomeraatteja ja kahdeksan serisiitti-albiitti muuttuneita kvartsiitteja. Konglomeraattien suurimmat zirkonipopulaatiot asettuvat noin 2.015 Ga ikään ja niiden maksimi kerrostumisiät ovat 1910 ± 10 Ma (120059_A) ja 1919 ± 5 Ma (120071_A). Luultavasti Savukosken ryhmän ja Kittilän sviitin kivet ovat olleet paikallinen lähde 2.05-2.00 Ga zirkoneille. Kvartsiittien suurimmat zirkonipopulaatiot asettuvat noin 1.95-1.90 Ga ja niiden maksimikerrostumisikä on 1.86-1.90 Ga välillä. Felsinen magmatismi Lapin granuliittivyöhykkeellä on mahdollinen materiaalinlähde näille zirkonipopulaatioille.

Verrattaessa työn zirkonipopulaatioita muihin julkaisuihin osoittautuivat kaikki työn näytteet Kummun ryhmän kiviksi, konglomeraattien ollessa kuitenkin hieman vanhempia. Osassa zirkoni rakeista on havaittavissa metamorfista ylikasvua.

Asiasanat: Zirkoni, U-Pb geokronologia, kultaesiintymä, metasedimentti, stratigrafia,

ABSTRACT FOR THESIS

Research Unit	**Degree Programme**
University of Oulu Faculty of Technology	Degree Programme in Geology and Mineralogy
Author Harju, Samuli Aleksi	**Thesis Supervisor** Ranta, Jukka-Pekka

Title of Thesis
U-Pb zircon dating of metasedimentary rocks within the Ikkari gold deposit, Central Lapland belt, northern Finland

Major Subject	**Type of thesis**	**Submission Date**	**Number of Pages**
Geosciences	Master's Thesis	December 2022	41 p., 3 app.

Abstract

The gold deposit of Ikkari located in Central Lapland belt, near Jeesiö and Rajala villages. Central Lapland belt have been divided to six units from oldest to youngest: Salla group, Kuusamo group, Sodankylä group, Savukoski group, Kittilä suite and Kumpu group. The purpose of this study was to figure out how old metasediments of Ikkari are and what stratigraphy unit they represent by using U-Pb method to zircon grains and comparing these age results to older publications. Mineralogy and lithology of the samples were studied in petrography studies from thin section.

Two of the samples are conglomerates and eight are sericite-albite altered quartzites. Major zircon populations of the conglomerates occur ca. 2.015 Ga and maximum deposit ages of them occur 1910 ± 10 Ma (120059_A) and 1919 ± 5 Ma (120071_A). Rocks of Kittilä suite and Savukoski group are probably the local source for the sedimentary material of this age. Major zircon populations of the quartzites occur ca. 1.95-1.90 Ga and maximum deposit ages of them are between 1.90-1.86 Ga. The felsic magmatism in the Lapland Granulite belt is potential source for the material of this age zircon populations.

Based on U-Pb ages of the detrital zircon populations of this study, samples can be correlated in to the Kumpu group. The conglomerates are slightly older than the quartzites. Metamorphic overgrowth occurs in some zircon grains.

Keywords: Zircon, U-Pb geochronology, gold deposit, metasediment, stratigraphy

Table of Contents

APPENDICES:

1. INTRODUCTION

Geochronology is one of the most important tools for studying and understanding evolution of the supracrustal units and its internal stratigraphy. Not only it gives valuable information on the order of deposition of sedimentary and volcanic rocks but can also be used to characterize and uncover the formation processes and timing of ore deposits (Cuney, 2021). Zircon ($ZrSiO_4$) is one of the most commonly used mineral in geochronological studies (Crowley et al., 2014). When crystallized, zircon incorporates uranium (U) into the crystal structure. Uranium is a radioactive element with two main isotopes ^{238}U and ^{235}U with decay series ending to radiogenic isotopes of lead, ^{206}Pb and ^{207}Pb. During crystallization, zircon incorporates very little Pb, making it ideal tool for dating, as the decay constant of U-isotopes are known (MacDonald, 2013).

Paleoproterozoic supracrustal units within the Fennoscandian shield have been shown to be highly potential for various types of metallic deposits, ranging from ultramafic hosted Ni-Cu-PGE deposit to structurally controlled hydrothermal Au, Au-Cu, Au-Co deposits (Weihed et al., 2008). Understanding of the formational processes and geological evolution of these deposits are challenged by the high metamorphic degree of the rocks and multiple deformation events that have caused complex interference patterns of the lithological units of the area. In those supracrustal areas, Central Lapland belt is one of the most promising metallogenic area within the Fennoscandia with known actively mined mineral deposits, including Europe´s largest active gold mine (Kittilä Au mine) along with numerous Au-rich occurrences. The Ikkari Au deposit represent one of those occurrences with preliminary resource estimates of ~4 MoZ Au (Rupert Resources Ltd, 2021).

First signs from Ikkari Au deposit were noticed from base of till research of area in beginning of 2019. First drill hole at the area was drilled in April 2020 which encountered 54m interval with 1.5 g/t Au. The subsequent drilling expanded the known mineralized trend spanning over 500 m wide and including also high gold concentrations (Rupert resources, 2022). First inferred mineral resource estimate for Ikkari published in September 2021 reported 49 million tonnes (Mt) at 2.5 grams per tonne gold (g/t Au) for 3.95 million ounces (Rupert Resources Ltd, 2021). The Ikkari area is located between the Sodankylä and the Kittilä municipalities near Jeesiö and Rajala villages (Figure 1).

In this study, results of U-Pb dating of detrital zircons from the metasedimentary units within the Ikkari Au deposit are reported. The goal is to better characterize the stratigraphical relationships of the different rock units in the area. Work is done in collaboration with University of Oulu and Rupert Finland Oy, subsidiary of the Rupert Resources Ltd.

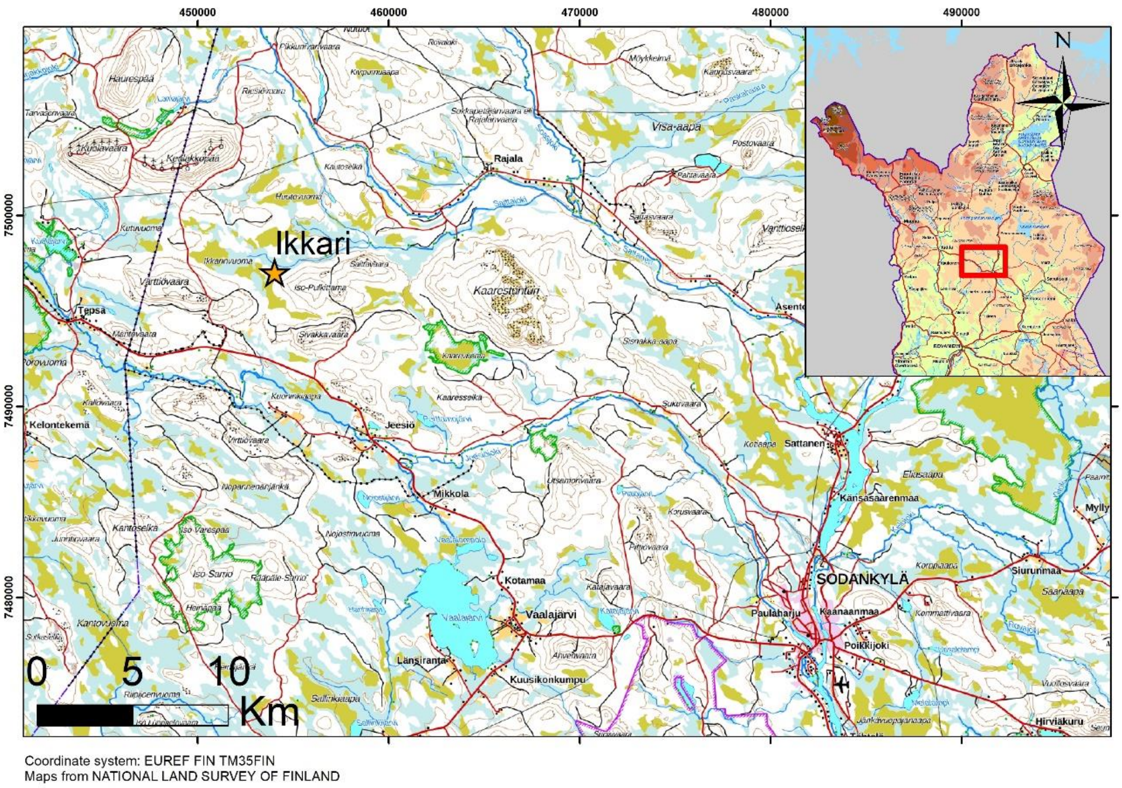
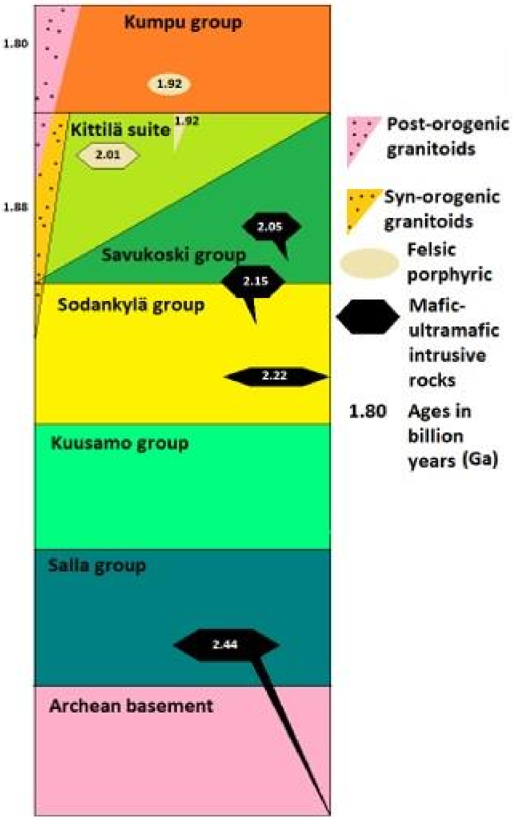


Figure 1. Topographical map showing the location of the Ikkari gold deposit. Inset figure shows the area in more regional context.

2. GEOLOGICAL SETTING

2.1. Central Lapland belt

Central Lapland belt (previously Central Lapland Greenstone Belt) represents Paleoproterozoic supracrustal belt where volcanic and sedimentary units were deposited onto the rifting Archean basement within ca. 600 Ma timeframe between ca. 2.5 Ga and 1.88 Ga (Köykkä et al., 2019). Central Lapland belt have been divided to six units (Figure 2), from oldest to youngest: Salla group, Kuusamo group, Sodankylä group, Savukoski group, Kittilä suite and Kumpu group. The rocks of these groups comprise felsic to ultramafic volcanic rocks and sedimentary units (Hanski and Huhma, 2005), 2.44–2.05 Ga mafic–ultramafic intrusive rocks, 1.92–1.88 Ga felsic porphyritic/lamprophyric rocks, and 1.88 Ga syn- to 1.80 Ga post orogenic granitoids which are intruded to the supracrustal rocks of CLB (Köykkä et al., 2019).



Group/Suite (Age)	Lithology
Kumpu Group (≥1.88 Ga)	Conglomerates, quartzites, and minor felsic vulcanite rocks
Kittilä suite (2.15-2.0 Ga)	Mafic metavolcanic rocks with massive, pillow, hyacloclastic, tuffite and breccia structures. metagraywackes, Sediment rocks: phyllites, graphite- and sulfite bearing schists, Banded iron formations and minor carbonated rocks
Savukoski group (2.15-2.05 Ga)	Volcanic rocks: massive lavas, pillow lavas, volcanic breccias, agglomerates and komatiite-picrite rocks. Sedimentary rocks: black schist, tuffites, and graywackes
Sodankylä group (≥2.22 Ga)	Orthoquartzites, fuchsite bearing sericite quartzites, mica schist, dolomites, stromatolites and minor mafic volcanic rocks partly with amygdaloidal structure
Kuusamo group (2.44-2.38 Ga)	Komatiites, komatiitic basalts, high-magnesian basalts, basalts, basaltic andesites and andesites
Salla group (≥2.44 Ga)	Felsic to intermediate metavolcanic rocks as basaltic andesite, dacite, rhyolite
Archean basement (3.1-2-6 Ga)	Granites and gneisses

Figure 2. Stratigraphy of Central Lapland Belt, including ages and lithology of units (Modified from Köykkä and Luukas, 2019 and Huhma et al., 2018)

2.1.1. Salla group

Salla group (>2440 Ma; Hanski and Huhma, 2005) is the lowermost and oldest unit in the Central Lapland belt and overlie the Archean basement. The rocks occur in central and eastern part of the belt and are best exposed in the Salla area with outcrops showing primary structures of amygdaloidal volcanic rocks. The composition of the Salla group rocks is varying from intermediate to felsic (basaltic andesites, dacites and rhyolites) and have been metamorphosed under greenschist facies.

2.1.2. Kuusamo group

Former name of the Kuusamo group is Onkamo group (Luukas et al., 2017). Rocks of the Kuusamo group are comprised of ultramafic-mafic to intermediate rocks which are widely spread in Lapland and well exposed in the Salla area (Hanski and Huhma, 2005). Mafic and intermediate lavas are commonly amygdaloidal. Ultramafic rocks are mostly fragmental komatiites. Other extrusive rocks are reported as agglomerates, tuffs, variolitic pillow lavas and pillow breccias, komatiites, andesitic lavas with gneissic xenoliths. On average, the Kuusamo group rocks are more primitive and more varying compared to the Salla group rocks (Hanski and Huhma, 2005). Minimum age of the Kuusamo group is 2383 ±33 Ma, determined from dike which cut the Kuusamo group volcanic rocks (Hanski and Huhma, 2001). Maximum deposition age of 2405 ±6 Ma for the Kuusamo group is determined from porphyry clasts of base conglomerate (Köykkä et al., 2019).

2.1.3. Sodankylä group

Sodankylä group rocks are deposited on the top of the Kuusamo group. It consists mainly of sedimentary rocks with minor mafic volcanic rocks (Hanski and Huhma, 2005). The rocks are widely spread on the Central Lapland belt. The Sodankylä group rocks includes sericite quartzites, orthoquartzites, mica schists and dolomites with characteristic stromatolite structures. Green tint is very common feature for sericite quartzites of the Sodankylä group which is due to Cr-bearing mica, fuchsite. Primary textures such as crossbedding, graded bedding, herringbone structures and mud cracks are present in the metasediments (Nikula, 1988). There are also some amygdaloidal structures in mafic volcanic rocks of the Sodankylä group and these usually present few tens of meters thick units (Hanski and Huhma, 2005). These metavolcanic rocks are mainly tholeiitic and basaltic andesite. Some albitization is present also in rocks of the Sodankylä group (Köykkä et al., 2019). Minimum deposition age of the Sodankylä group is 2.22 Ga that is determined from mafic-ultramafic sills cutting the rocks of the Sodankylä group (Huhma et al., 2018).

2.1.4. Savukoski group

Rocks of the Savukoski group overlie the rocks of the Sodankylä group (Hanski and Huhma, 2005). Although these two groups represent different tectonics phases, there is not significant hiatus or discordance between them. The Savukoski group includes black schist and graywackes in bottom parts of the unit, and mafic tuffites and ultramafic volcanics in the upper parts of the unit (Köykkä and Luukas, 2019). The 2.05 Ga age of the Savukoski group has been determined from diabase dikes which cut the Savukoski group rocks (Huhma et al., 2018). Kevitsa mafic-ultramafic layered intrusion is probably most well-known deposit from the Savukoski group. It is intruded to the bottom part metasediments (Köykkä and Luukas, 2019).

2.1.5. Kittilä suite

Luukas et al., (2017), reclassified the Kittilä group to the Kittilä suite based on poor knowledge of its internal stratigraphy and its allochthonous nature. The Kittilä suite covers over 2600 km^2 area from the central parts of the Central Lapland belt and that area is called Kittilä greenstone complex (Hanski and Huhma, 2005) or Kittilä greenstone area (Rastas et al., 2001). The Kittilä suite includes massive amount of mafic metavolcanic rocks, hyaloclast, tuffites and breccias (Hanski and Huhma, 2005). Thickness of these folded volcanic rocks reach probably vertically even 9 km based on geophysical measurements (Niiranen, 2015). There are also different types of sedimentary interbeds and larger sedimentary units. These includes metagraywackes, phyllites, graphite- and sulfite bearing schists, and minor carbonated rocks. One of the most markable of these sedimentary units are banded iron-formations (e.g. Porkonen Formation; Hanski and Huhma, 2005). Many 2.01 Ga pre-thrusting and 1.92 Ga post-thrusting granodiorite rocks is cutting the Kittilä suite rocks what give maximum deposition age ca. 2.0 Ga (Köykkä et al., 2019).

2.1.6. Kumpu group

Originally, Kumpu and former Lainio group were divided into two separate groups and are now combined to Kumpu group due to their similarities (Hanski and Huhma, 2005). The youngest rocks of the Central Lapland belt are belonging to the Kumpu group with maximum depositional age dated to be ca.1.88 Ga, determined from clast within Kumpu group conglomerates (Lehtonen et al., 1998; Hanski and Huhma, 2005). There is no reliable field evidence that the 1.80 Ga granites cut Kumpu group rocks, but they are known to cut Kittilä and Savukoski group rocks (Hanski et al., 2001)

The Kumpu group is comprised of 200-2000m thick sedimentary units. The Kumpu group rocks are the youngest arenaceous metasediments in the northern Finland (Lehtonen et al., 1998). Lithologies are coarse, molasse-like metasediments and they usually lie on folded formations of older groups. Typical feature of this group is red-brown and purple tint for rocks due to hematite pigment. Kumpu group conglomerates have clasts of rock types from underlying formations. The clasts include mafic metavolcanic rocks, tuffites, different kinds of schists, quartzite, arkose quartzite, vein quartz, chert, iron ore, albitite, rare carbonate rock as well as magmatic rocks such as metagabbro, diabase, granitoids, and felsic porphyries and red jasper fragments. They may also include some pebbles from older conglomerates (Hanski and Huhma, 2005). The type formation of the Kumpu group is the Levi formation which is located near the village of Sirkka village. Along with Kumpu group metasediments, minor calc-alkaline volcanic rocks occurring in the CLB has also an age of ca. 1.88 Ga (Hanski et al., 2001).

3. FORMATION OF GOLD DEPOSITS AND THEIR OCCURRENCE IN CLB

Earth`s crust contains average only 0.005 g of gold for each ton of rock which means gold need to enrich that it can be mineable. In nature, gold is often alloyed with silver or copper, also tellurides and selenides are common components in some systems. Gold often occurs together with pyrite and arsenopyrite (Herrington and Stanley, 2001).

3.1. Formations of gold deposits

According to Herrington and Stanley (2001) is recognized six or seven world-class primary gold deposit types excluding secondary deposits, as like placers: orogenic gold deposits, Carlin-type gold deposits, epithermal deposits, porphyry copper-gold deposits, iron oxide copper-gold deposits, gold-rich massive sulfide deposits. The seventh deposit type is Witwatersrand pebble-conglomerate type which may be an ancient alluvial placer.

Orogenic gold deposits forms during compressional to transpressional deformation processes at convergent plate margins in accretionary and collisional orogens. Subduction related thermal events, initiate and drive long-distance hydrothermal fluids migration. Gold be carried by hydrothermal fluid and forming gold-bearing quartz to mineable distance (Groves et al., 1998). Mineralogy of these deposits are usually quartz-dominant vein systems with $\leq$ 3–5% sulfide minerals (mainly Fe-sulfides) and $\leq$ 5–15% carbonate minerals. Albite, white mica, or chlorite, fuchsite, scheelite and tourmaline are also common gangue phases in veins in greenschist-facies host rocks (Groves et al., 1998).

Carlin-type deposits are epigenetic, disseminated, auriferous pyrite deposits enriched in As, Sb, Hg, and Tl that are typically hosted in calcareous sedimentary rocks. Deposits is named after a deposit near Carlin, Nevada. Gold ore in these deposits, usually occurs at intersections between faults and permeable reactive strata typically below an impermeable caprock and generally exhibits a central high-grade zone of carbonate dissolution and argillic alteration with micron-sized disseminated pyrite (Saunders et al. 2014).

Epithermal deposits at depths less than about 1,500 meters below the water table, in the uppermost parts of the crust, and at temperatures below about 300 °C. Most epithermal gold-silver deposits are related genetically to hydrothermal systems which are associated subaerial volcanism and intrusion of calc-alkaline magmas along convergent plate margins. Most known epithermal deposit are Cenozoic, but these deposits formed throughout most of geologic time (John et al. 2010)

Porphyry copper deposits are important potential sources for gold in lower temperature epithermal deposits and they are among the largest reservoirs of gold in the upper crust. Gold in porphyry copper deposits is found in solid solution in Cu–Fe and Cu sulfides and as small grains of native gold, often along boundaries of bornite (Kesler and Chryssoulis, 2002) Forming porphyry copper deposits are related to magma chambers deep below the deposit. Gold concentration of porphyry copper deposit can change a lot with different kind of formations. Hydrothermal fluids are associated gold enrichment in the porphyry copper deposits. (Chiaradia, 2020).

Iron oxide copper-gold (IOCG) deposits are formed from magmatic hydrothermal fluids and have many similarities with porphyry copper deposits, although there are also important differences. IOCG deposits are Fe oxide rich and have volumetrically extensive high-temperature alteration zones. These deposits occur predominantly occur in Precambrian rocks (Richards and Mumin, 2013). Formation depth of IOCG deposits ranges from the deep the upper crust to paleosurfaces (Groves et al., 2010).

Gold-rich volcanogenic massive sulfide (Au-VMS) deposits are defined a sub-type of both volcanogenic massive sulfide (VMS) and lode gold deposits. They consist of semi-massive to massive, concordant sulfide lenses underlain by discordant stockwork feeder zones as most VMS deposits. The main difference between other VMS deposits and Au-VMS deposits is their gold concentration (Dube et al., 2007).

3.2. Gold occurrences in Central Lapland belt

In Finland, supercontinent evolution of the region between ~2.75–1.77 Ga includes all gold-mineralized environments in here, except the possible Archean epithermal deposits and the recent placers. During the main stages of crustal growth globally 2.72–2.64 Ga and 1.91–1.77 Ga was formed most of the gold deposits in Finland (Eilu, 2015). Orogenic gold deposits are most common of the gold deposit types in Finland. One age group of orogenic gold deposits in Finland is related to the Svecofennian composite orogenies, at 1.91–1.77 Ga. During a continent–continent collision event at 1.84–1.78 Ga probably took place most of the Paleoproterozoic mineralization (Eilu, 2015).

Suurikuusikko gold deposit in Central Lapland belt, in Kittilä is the largest known gold deposit in northern Europe (Patison et al., 2007). According to Wyche et al. (2015) Re–Os age of 1916 ± 19 Ma obtained from gold-bearing arsenopyrite suggest that Suurikuusikko mineralization took place 60–100 Ma after Kittilä group deposition and before the end of collision-related sedimentation in the CLGB. Suurikuusikko has almost all features for typical an orogenic gold deposit. (Wyche et al. 2015). Repeated reactivation of major faults with barren hydrothermal pulses occurred between 1.86-1.81 Ga in CLB. In Kittilä province gold deposition of several small deposits (e.g. Levijärvi, Iso-Kuotko, Saattopora) are overprinted by the early hydrothermal assemblages during the 1.81-1.75 Ga, late-to post-orogenic stages of the Svecofennian tectonic evolution (Molnar, 2021).

4. ZIRCONS IN GEOCHRONOLOGY AND U-Pb DATING

Zircon ($ZrSiO_4$) is highly potential for U-Pb dating due to its excellent properties. It is very hard mineral with 7.5 Mohs hardness scale and because of that, it has good resistance for mechanical weathering. Zircon has high melting temperature, and it also has good resistant to chemical weathering and metamorphism. Zircon has relatively high density (4.6 g/cm^3) and non-magnetic which makes it easier to separate using heavy liquid separation. It has measurable amount of U and usually very high $^{238}U/^{204}Pb$ ratio, meaning that zircon incorporates negligible amount of non-radiogenic lead into its crystal structure. Zircon is common accessory mineral in variety igneous and metamorphic rocks and it can survive many sedimentary cycles (Pirkle and Podmeyer, 1993), making it one of the most common geochronological tools for metasedimentary studies.

Radiation damage and hydrothermal alteration can be seen from zircons through changes in crystal structures, oxygen isotope values and petrographic and geochemical characteristics. Alteration states of zircons can be seen from their Th, U and REE contents (Liu et al., 2019). Variable morphologies and internal structures are seen in metamorphic zircons formed under different metamorphic conditions. Metamorphic zircons can have example different zoning structures (Wu and Zheng, 2004), with zones representing different stages of zircon growth (e.g. metamorphic vs. hydrothermal; e.g. Rubatto et al., 1999).

4.1. U-Pb analyses

In nature, uranium (U) has three radioactive isotopes. Isotopes ^{238}U (~97.275%) and ^{235}U (0.720%) are the most common ones but there is also small amount of ^{234}U (~0.005%) isotope in nature (Babu et al., 2008). Isotopes ^{238}U and ^{235}U are used in geochronology. Isotope ^{238}U decays to stable ^{206}Pb but decaying is not direct but goes through series of short-lived daughter isotopes before the stable radiogenic ^{206}Pb. The isotope half-life to ^{206}Pb is 4.468 Ga. Isotope ^{235}U decays to stable ^{207}Pb By similar type of decay chain of short-lived daughter isotopes. This isotope half-life to ^{207}Pb is 703.8 Ma (Schoene, 2014).

Non-radiogenic lead isotope ^{204}Pb is called common lead in U-Pb geochronology. Common lead can cause bias to age determination. It only occurs trace amounts in zircon crystallizing but it can increase during weathering or hydrothermal alteration. The common lead can also increase from contamination of molding chase or other sample preparations chases (Andersen et al., 2019).

There are four isotopes (^{204}Pb, ^{206}Pb, ^{207}Pb, ^{208}Pb,) for natural Pb. Three of these are radiogenic. Here are the equations for the radiogenic isotopes (Vermeesch, 2021) (Formulas 1, 2, 3):

$$^{206}Pb* = {}^{238}U\left(e^{\lambda 238 t} - 1\right) \quad (1)$$

$$^{207}Pb* = {}^{235}U\left(e^{\lambda 235 t} - 1\right) \quad (2)$$

$$^{208}Pb* = {}^{232}Th\left(e^{\lambda 232 t} - 1\right) \quad (3)$$

The ingrowth equations for the three radiogenic Pb isotopes with $\lambda_{238} = 1.551359 \times 10^{-10} a^{-1}$ ($t_{1/2} = 4.468$ Ga), $\lambda_{235} = 9.845841 \times 10^{-10} a^{-1}$ ($t_{1/2} = 703.8$ Ma), and $\lambda_{232} = 0.4933431$ P$\times 10^{-10} a^{-1}$ ($t_{1/2} = 14.05$ Ga)

The corresponding age equations are (Vermeesch, 2021) (Formulas 4, 5, 6):

$$t_{206} = \frac{1}{\lambda_{238}} \ln\left(\frac{^{206}Pb*}{^{238}U} + 1\right) \quad (4)$$

$$t_{207} = \frac{1}{\lambda_{235}} \ln\left(\frac{^{207}Pb*}{^{235}U} + 1\right) \quad (5)$$

$$t_{208} = \frac{1}{\lambda_{232}} \ln\left(\frac{^{208}Pb*}{^{232}U} + 1\right) \quad (6)$$

The equation for normalizing common lead(^{204}Pb) (Vermeesch, 2021) (Formulas 7, 8, 9):

$$\frac{^{206}Pb}{^{204}Pb} = \left(\frac{^{206}Pb}{^{204}Pb}\right)_{\circ} + \frac{^{238}U}{^{204}Pb}\left(e^{\lambda 238 t} - 1\right) \qquad (7)$$

$$\frac{^{207}Pb}{^{204}Pb} = \left(\frac{^{207}Pb}{^{204}Pb}\right)_{\circ} + \frac{^{235}U}{^{204}Pb}\left(e^{\lambda 235} - 1\right) \qquad (8)$$

$$\frac{^{208}Pb}{^{204}Pb} = \left(\frac{^{208}Pb}{^{204}Pb}\right)_{\circ} + \frac{^{232}Th}{^{204}Pb}\left(e^{\lambda 232 t} - 1\right) \qquad (9)$$

Because different isotopes have same parent-daughter pair, U-Pb datings have access to two separate geochronometers ($^{206}Pb/^{238}U$ and $^{207}Pb/^{235}U$) that can be evaluated separately and together. This makes U-Pb dating reliable technique and powerful tool in geochronology (Vermeesch, 2021)

$^{206}Pb/^{238}U$ and $^{207}Pb/^{235}U$ are presented together in so-called concordia diagram by Wetherill (1956). Concordia curve is not linear due to the different half-lives of the ^{238}U and ^{235}U isotopes. If mineral under dating has remained as close system after its crystallization, sample will plot on the concordia curve and age can be determined directly. Is mineral system has been opened at some point of the history after crystallization, it could have lost e.g. part of the radiogenic lead. Therefore, the sample do not plot directly on to the concordia curve, but below or in top of it and sample is said to have discordant age (Schoene, 2014). Discordant arrays can be caused by Pb loss, Pb gain, U loss, U gain and mixing of different-aged material. Usually, in a sample, there are several data points with similar evolution but with different amounts of Pb loss. This difference can form linear path from the origin towards the date which corresponds the real age on concordia curve (Figure 3a). This line can also cut the concordia curve at above origin and the cutting point corresponds to the time of the Pb-loss event. The upper cutting point can then correspond the true formation age of the mineral (Figure 3b). This method can give valuable information from Pb-loss events and give new tools to interpret datings (Schoene, 2014).

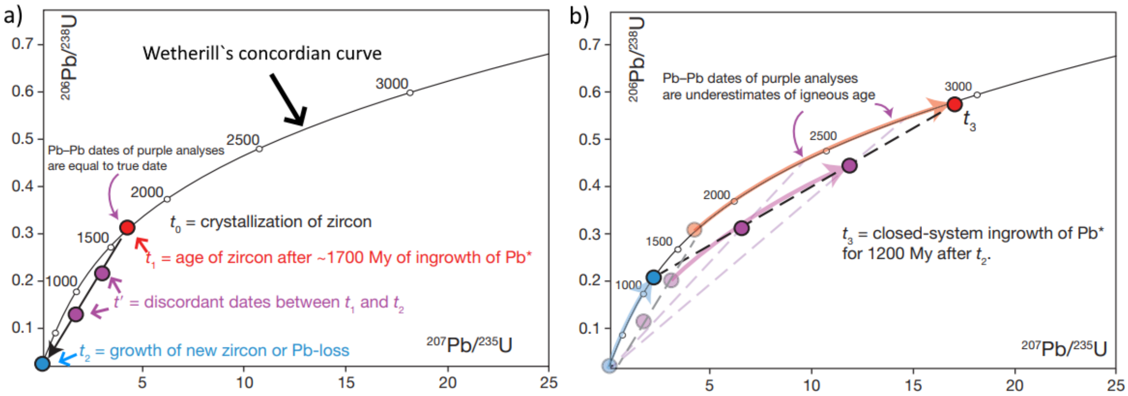


Figure 3. Pb-loss event present on Wetherill`s concordia curve (Modified from Schoene, 2014).

4.2. Metamorphic zircons and alteration of zircons

According to Williams (2001), zircon is suggested being relatively refractory during low- to moderate-pressure metamorphism, but recent studies have suggested that it is possible for zircon also to alter in relatively low temperatures. Spandler et al., (2004), reported one of the lowest temperatures of zircon alteration in metamorphic rocks where temperature was <100 °C. More common alteration and metamorphic growing is observed in temperatures 250-450 °C (Kohn et al., 2018). Kohn et al., (2018), represented four different ways to form metamorphic zircon: low-grade processes (Figure 4a), retrograde release of Zr from major minerals (Figure 4b), crystallization of in situ melts (Figre 4c), and Ostwald ripening (Figure 4d).

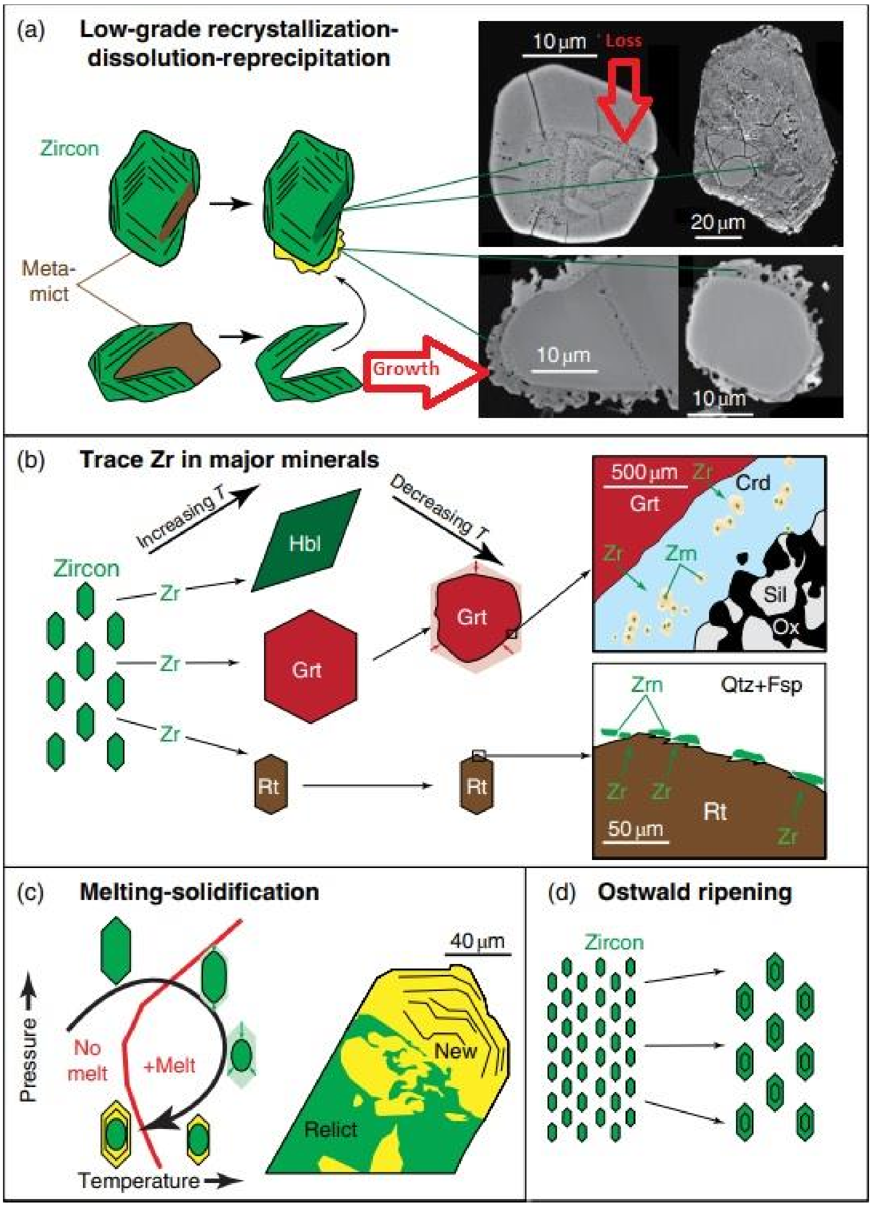


Figure 4. Four different ways to form metamorphic zircons. Modified figure from Kohn et al., (2018).

Alpha radiation is the most important cause as zircon becoming to metamictic state. Zircon can change to amorphous during metamictization (Nasdala et al., 1996). In low-grade processes metamict zircon may dissolve or recrystallize and reprecipitate either within a crystal or as overgrowths on other crystals (Figure 4a) (Kohn et al., 2018).

Zr concentrations of most silicates are extremely low. Few minerals, especially garnet, hornblende and rutile can contain ppm-level concentration of Zr and the concentration increases exponentially when temperature increases. Typical rocks contain approximately 100-200 ppm Zr dominantly is hosted in zircon at low metamorphic grades. Rocks with rutile, garnet or hornblende can contain a lot more Zr (Kohn et al., 2018). Several percent of zircon must dissolve that Zr can provide to rutile, garnet and hornblende. As temperature increases, zircon dissolves and rutile, garnet and hornblende must first grow that they can take up increasingly more Zr (Figure 4b). Figure 4c present a zircon grain which is reform during cooling. Melt has formed younger overgrowths on rim of older zircon nuclei. Textures of zircons in migmatitic rocks support this assumption. In paleosomes, zircons occur usually rounded and do not display zircon overgrowth around the cores that have not interacted with melts. In contrast, zircons in leucosomes or in melanosomes that have interacted with melt, exhibit euhedral shapes and can have large late-stage overgrowths (Kohn et al., 2018).

Ostwald ripening is a thermodynamically driven process. It is due to a larger crystal having less surface-free energy relative to total free energy than a smaller crystal. Smaller crystals dissolves and larger crystals grows because of that difference in free energy. When small crystals become smaller their dissolution rates should accelerate (Figure 4d) (Kohn et al., 2018).

Zircon alteration is usually caused by re-equilibration, recrystallization, dissolution-reprecipitation, neoblastic growth, and/or metamictization. Characteristic to zircon alteration are structural, isotopic and geochemical changes to the original crystal which usually exhibited as distinct micrometer to submicrometer mineral domains (Schneider et al., 2012). Often alteration zones of zircon have overlooked and removed for conventional U-Pb geochronology due to that they disturb normally concordant isotopic systems. It has been studied that chemical and isotopic systems of the alteration zones have signatures in which can obtain valuable geological information from the timing and nature of fluid influx (Schneider et al., 2012). According to Lankvelt et al., (2016), under lower temperature conditions, hydrothermally precipitated and altered precipitated zircon may be associated with metallic ore deposits.

4.3. Use of sedimentary rocks and detrital zircons in age dating

Detrital zircons occur in almost every sedimentary rock. Sedimentary rocks could contain zircons from many different sources (Tapia-Fernandez et al., 2017). Detrital zircons end up to sedimentary rocks by first eroding from pre-existing rocks and then transporting during sedimentation. Finally, they are part of sedimentary rocks (Morton and Hallsworth, 1999). Detrital zircons record important information from their origin

(Condie et al., 2009). One study from Australia shows, that the youngest detrital zircons in Holocene beach sands are Permian making them 250 Ma older than the age of deposition (Tapia-Fernandez et al., 2017). This example explains that detrital zircons in sedimentary rock can be much older than the actual sedimentation age.

Since at least 3.7-3.8 billion years ago, sediments have been continuously deposited. Sediment rocks are most common lithology in the geological record. Sedimentary rocks record important information from geological and biological events. Among other things, the information obtained from the geochronology can show scale and duration of events (Rasmussen, 2005). Publications from detrital zircon geochronology are exponentially increased in the 2000s. This is due to that technical advance have made it possible to efficiently determine reliable U-Pb ages from individual crystals (Gehrels, 2014).

Maximum depositional age of the sedimentary units can be determined from youngest detrital zircon grain because sedimentary unit cannot be older than its youngest zircons. There are still several things what can affect age results, for an example Pb loss which increases the analytical uncertainties (e.g., Gehrels, 2014). That means that the results usually have both younger and older ages than the true age of the unit. Most cases the youngest age will be younger than the true age (Gehrels, 2014). Method to avoid this problem, is to use the age of the youngest group of ages from sample (Dickinson and Gehrels, 2009). One of these methods is YC1σ (2+) what is defined by sorting all analyses by their U-Pb age plus 1σ uncertainty and identifying the youngest cluster of 2 or more ages of analyses with overlapping 1σ error (Sharman et al., 2018).

Despite these uncertainties, the youngest detrital zircon grains often give useful information about depositional age (Gehrels, 2014). Gehrels (2014) presented several studies which have used detrital zircons of sedimentary rocks for many different purposes. One example of that is a study of early earth evolution with detrital zircons. (Harrison, 2009). In future there are many possibilities for detrital zircon research when new analytical methods and applications are developed (Gehrels, 2014).

4.4. Morphology of zircon grains

Roundness of zircon grains and their ages can be used to study their physical transportation processes (Pupin, 1980). Morphology of the crystals can potentially reveal information of the zircons transportation, deposition and recycling processes of the sedimentary environment. Detrital zircon grains that have undergone extreme alluvial or eolian processes and have recycled multiple times, are usually highly rounded. Zircon grains which have undergone limited transport can imply more angular (Köykkä et al., 2019).

5. SAMPLING AND ANALYTICAL METHODS

5.1. Sampling

Samples for the age determination were collected from drill cores owned by Rupert Finland Oy. 10 representative ¼ core samples were collected with total weight approximately 223 kg.

Geology survey of Finland (GTK) conducted the sample preparation, analyzing and helped with data processing. Handpicking of the zircon grains and SEM-BSE imaging was done in the Geological Survey of Finland Laboratory in Espoo.

5.2. Sample preparation

Approximately 5 kg per sample were crushed with cone crusher. Crushed samples were sieved to 7 different fractions from largest to smallest >2 mm, 2-1 mm, 1 mm-500 µm, 500-250 µm, 250-125 µm, 125-63 µm and <63 µm. Fraction 125-63 µm was used to heavy liquid separation (diiodomethane, d= 3.325 kg/m3). Zircon have density about 4.7 kg/m^3 so zircon along with other heavy mineral grains sink to bottom of the sample container. 9 of 10 from samples have left more than 0.05g heavy fraction after separation. Only from a 120112-A sample resulted no heavy fraction at all from 125-63 µm fraction. New heavy liquid separation with 250-125 µm fraction was done to that sample and resulted more than 0.05g heavy fraction left. Zircon grains were handpicked under the microscope. The goal was to pick at least 100 zircon grains in order to get statistically meaningful age distribution from dating.

5.3. LA-ICPMS Attom

Zircon grains for U-Pb dating were selected by hand-picking from the delivered fractions, after additional separation steps (sulphide removal, clerici separation). The grains were mounted in epoxy resin and sectioned approximately in half and polished. Back-scattered electron images (BSE) and cathodoluminescence (CL) images were prepared for the zircons to target the spot analysis sites. U–Pb dating analyses were performed using a Nu Plasma AttoM single collector ICPMS at the Geological Survey of Finland in Espoo connected to a Photon Machine Excite laser ablation system. Samples were ablated in He gas (gas flows in mass flow controllers = 0.4 and 0.1 l/min) within a HelEx ablation cell

(Müller et al., 2009). The He aerosol was mixed with Ar (gas flow= 0.98-0.99 l/min) prior to entry into the plasma. The gas mixture was optimized daily for maximum sensitivity. Ablation conditions were: beam diameter: 20 µm, pulse frequency: 5 Hz, beam energy density: 2.17 J/cm2. A single U–Pb measurement included a short pre-ablation with a 25 µm beam, 10 s of on-mass background measurement, followed by 30 s of ablation with a stationary beam. 235U was calculated from the signal at mass 238 using a natural $^{238}U/^{235}U$=137.88. Mass number 204 was used as a monitor for common ^{204}Pb. The contribution of ^{204}Hg from the plasma was eliminated by on-mass background measurement prior to each analysis. Age related common lead (Stacey and Kramers, 1975) correction was used when the analysis showed common lead contents significantly above the detection limit (i.e., >60 cps). Signal strengths on mass 206 were typically 250000 cps, depending on the uranium content and age of the zircon.

Calibration standard GJ-1 (609 ± 1 Ma; Belousova et al., 2006), in-house reference samples A382 (1877±2 Ma, Huhma et al, 2012), and A1772 (2712 ±2 Ma, Huhma et al., 2012) were run at the beginning and end of each analytical session, and at regular intervals during sessions. Raw data were corrected for the background, laser induced elemental fractionation, mass discrimination and drift in ion counter gains and reduced to U–Pb isotope ratios by calibration to concordant reference zircons, using the program Glitter (Van Achterbergh et al, 2001). Further data reduction including common lead correction and error propagation was performed using excel spreadsheet written by Y. Lahaye and H. O'Brien. Errors include measured within-run errors (SD) and quadratic addition of reproducibility of standard (SE). Estimated errors in the calibration standard GJ1 were: 0.2% for $^{207}Pb/^{206}Pb$, and 2% for both $^{206}Pb/^{238}U$ and $^{207}Pb/^{235}U$. To minimize the effects of laser-induced elemental fractionation, the depth-to-diameter ratio of the ablation pit was kept low, and isotopically homogeneous segments of the time-resolved traces were calibrated against the corresponding time interval for each mass in the reference zircon. Plotting of the U-Pb isotopic data and age calculations were performed using the Isoplot/Ex 3 program (Ludwig, 2003). All the ages were calculated with 2σ errors and without decay constants errors. Data-point error ellipses in the figures are at the 2 σ level. The $^{207}Pb/^{206}Pb$ age offset from concordant ID-TIMS ages for several samples does not exceed 0.5%.2

6. RESULTS

Samples in this study represent conglomerates and variable altered quartzites. Individual samples and their lithologies are listed in the Table 1.

Table 1. Sample Id, hole Id and lithologies of the samples.

Sample Id	**Hole Id**	**Lithology**
120059_A	120059	Conglomerate
120063_A	120063	Sericite-albite altered quartzite
120071_A	120071	Conglomerate
120074B_A	120074B	Sericite altered quartzite
120094&120097_A	120094&120097(Combined)	Sericite altered quartzite
120098_A	120098	Sericite altered quartzite
120100_A	120100	Sericite-albite altered quartzite
120112_A	120112	Sericite altered quartzite
120112_B	120112	Sericite-albite altered quartzite
120112_C	120112	Sericite-albite altered quartzite

6.1. Petrographic description

Conglomerates

120059_A is conglomerate located within the central part of the Ikkari deposit. The thin section is comprised of quartz (80%), biotite (10%), carbonates (6%) and opaque (4%) as primary minerals and chlorite and zircon as accessory minerals. The conglomerate is matrix-supported. Matrix of thin section varies a lot (Figure 5a). There are mainly coarse undulating quartz clasts with fine grained quartz, carbonate grains and quite lot of large opaque minerals. There are also one large and several smaller spots of biotite. Biotite is locally showing alteration to chlorite. Opaque minerals are pyrite and magnetite.

120071_A is conglomerate within central part of the Ikkari deposit. The conglomerate is matrix-supported. Matrix is very fine sericite and quartz (Figure 5c). The thin section has medium clastic texture. Clasts are composed of quartz. The thin section has quartz 75%, sericite 18%, plagioclase/albite 5% and carbonate 2% as primary minerals and as accessory minerals are zircon and opaque which are mainly pyrite and magnetite.

Quartzites

The sample 120074B_A is sericite altered quartzite within the central part of the Ikkari deposit. There are mostly coarse quartz grains in sericite-quartz matrix. Also there occurs fine grained quartz veins. The thin section has fine clastic texture. At least one chlorite vein is in this thin section (Figure 5d). All opaque minerals are in chlorite vein in this thin section and those are mainly magnetite. The thin section has quartz 70%, sericite 20%, chlorite 9% and opaque 1% as primary minerals and zircon and carbonates as accessory minerals.

120094&120097_A is sericite altered quartzite within the central of the Ikkari deposit. Coarse quartz grains occur in fine grainsized sericite matrix (Figure 5e). Middle of the thin section occur 2mm wide carbonate vein with plenty of opaque minerals. Opaque minerals are mainly magnetite and pyrite. The thin section has quartz 60%, sericite 25%, carbonates 12% and opaque 3% as primary minerals and k-feldspar, plagioclase/albite, biotite, chlorite, and zircon as accessory minerals.

The sample 120098_A is sericite altered quartzite within northern the Ikkari deposit. Thin section has quartz 85%, sericite 10% and opaque 5% as primary minerals. Carbonates and zircon occur as accessory minerals. Coarse quartz grains occur in very fine grainsized sericite matrix (Figure 5f). The thin section has medium clastic texture. Opaque minerals, mostly magnetite grains, occur all over thin section. Hematite exclusions occur in magnetite grains.

The sample 120112_A is sericite altered quartzite within northern part of Ikkari deposit. The thin section has quartz 45%, sericite 35%, carbonates 15% and opaque 5% as primary minerals and zircon as an accessory mineral. Base matrix is very fine grainsized quartz-sericite mix with fine hematite grains (Figure 6b). There are two coarse grainsized carbonates-quartz veins parallel to orientation of base matrix. In those carbonate-quartz veins occur a bit of gold (Figures 9c & 9d). Micro folding/crenulation cleavage can be seen from sericite-quartz matrix.

The sample 120063A represents sericite-albite altered quartzite located in the western part of the Ikkari deposit. Coarse quartz grains occur in very fine-grained sericite and quartz matrix (Figure 5b). There also are also some quartz veins where grainsize is coarse grained. Sericite-quartz matrix is lightly foliated. The thin section has quartz 70%, sericite

20%, albite 7%, carbonate 2% and opaque 1% as primary minerals and biotite and zircon as accessory mineral. Opaque minerals are mainly magnetite.

The sample 120100_A is sericite-albite altered quartzite sample within central of the Ikkari deposit. The thin section has quartz 50%, carbonate 20%, sericite 16%, plagioclase/albite 10% and opaque 4% as primary minerals and as an accessory mineral it has zircon. Matrix is fine quartz and albite grains in very fine sericite matrix (Figure 6a). There is large calcite vein in the middle of the thin section where occur a lot of opaque minerals. Opaque minerals are pyrite and magnetite.

120112_B is sericite-albite altered quartzite within northern part of the Ikkari deposit. The thin section has quartz 60%, sericite 25%, carbonates 10%, plagioclase/albite 3% and opaque 2% as an accessory mineral occur zircon. The thin section has medium clastic texture. Matrix is fine-grained sericite-quartz where are coarse quartz grains (Figure 6e). There are spots where occur carbonate grains. There are also few plagioclase/albite grains in matrix. Opaque minerals are hematite and magnetite.

The sample 120112_C is sericite-albite altered quartzite within northern part of the Ikkari deposit. The thin section has quartz 65%, sericite 15%, carbonates 10%, plagioclase/albite 7% and opaque 3% as primary minerals and zircon as an accessory mineral. Matrix is very fine grain sized sericite-quartz with many coarse grainsized quartz grains and some albite grains (Figure 6f). One 4mm wide carbonate vein occur in central part of the thin section. There are also small opaque grains allover of the base matrix. Opaque minerals are mainly magnetite with hematite exsolutions.

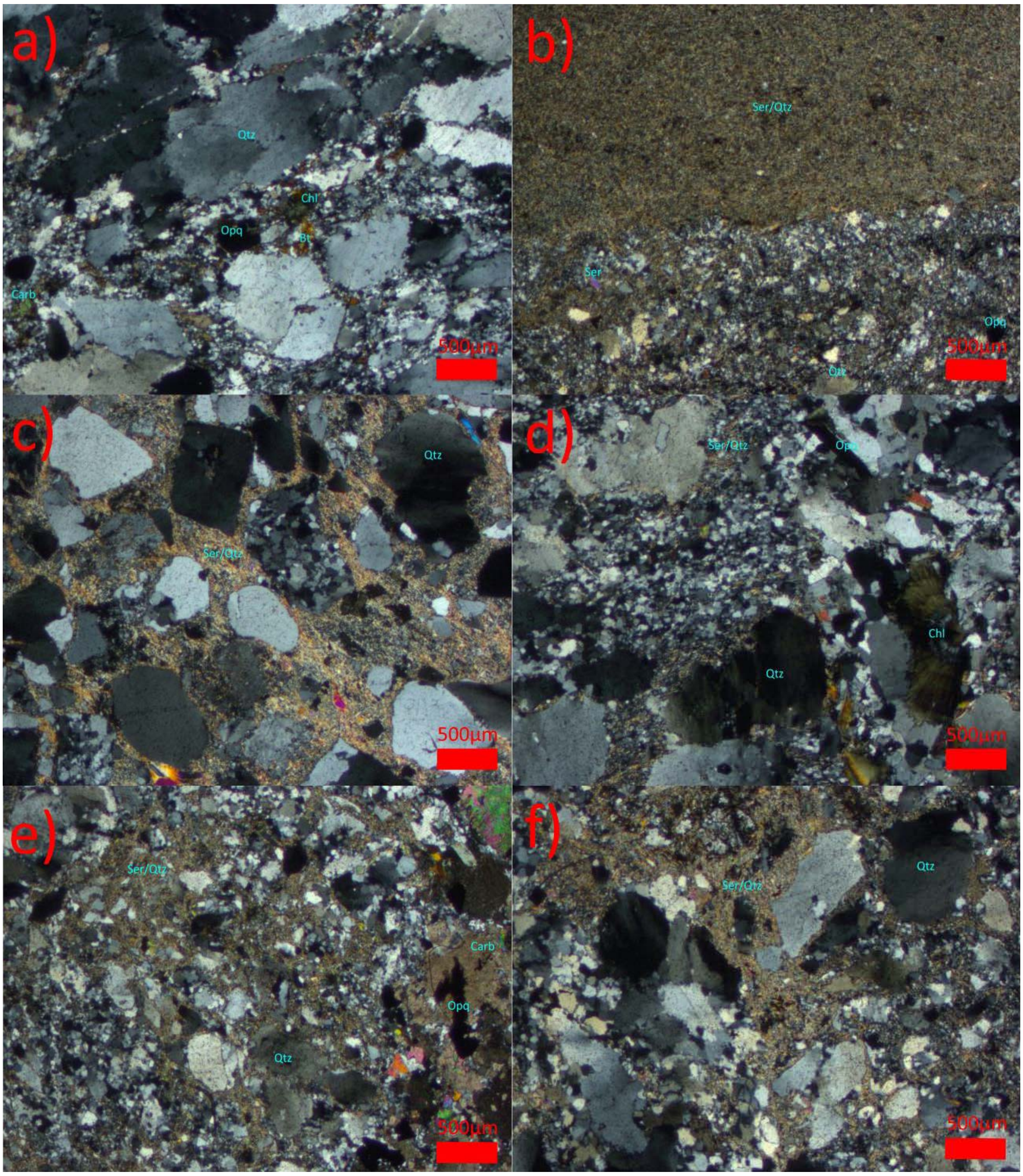


Figure 5. Thin section photomicrographs in crosses polarized light: a)120059_A Coarse quartz clasts in finer quartz matrix; b) 120063_A. Very fine grained sericite-quartz matrix contact to fine grained sericite-quartz matrix; c) 120071_A. Coarse quartz clasts in very fine grained sericite matrix; d) 120074B_A. Coarse quartz grains in fine grained sericite-quartz matrix and chlorite vein with magnetite; e)120094&120097_A. Coarse quartz grains in fine grained sericite-quartz matrix and carbonate vein with magnetite and pyrite; f) 120098_A. Coarse quartz grains in very fine grained sericite matrix. Bt: Biotite, Carb: Carbonate, Chl: Chlorite, Opq: Opaque, Qtz: Quartz, Ser: Sericite.

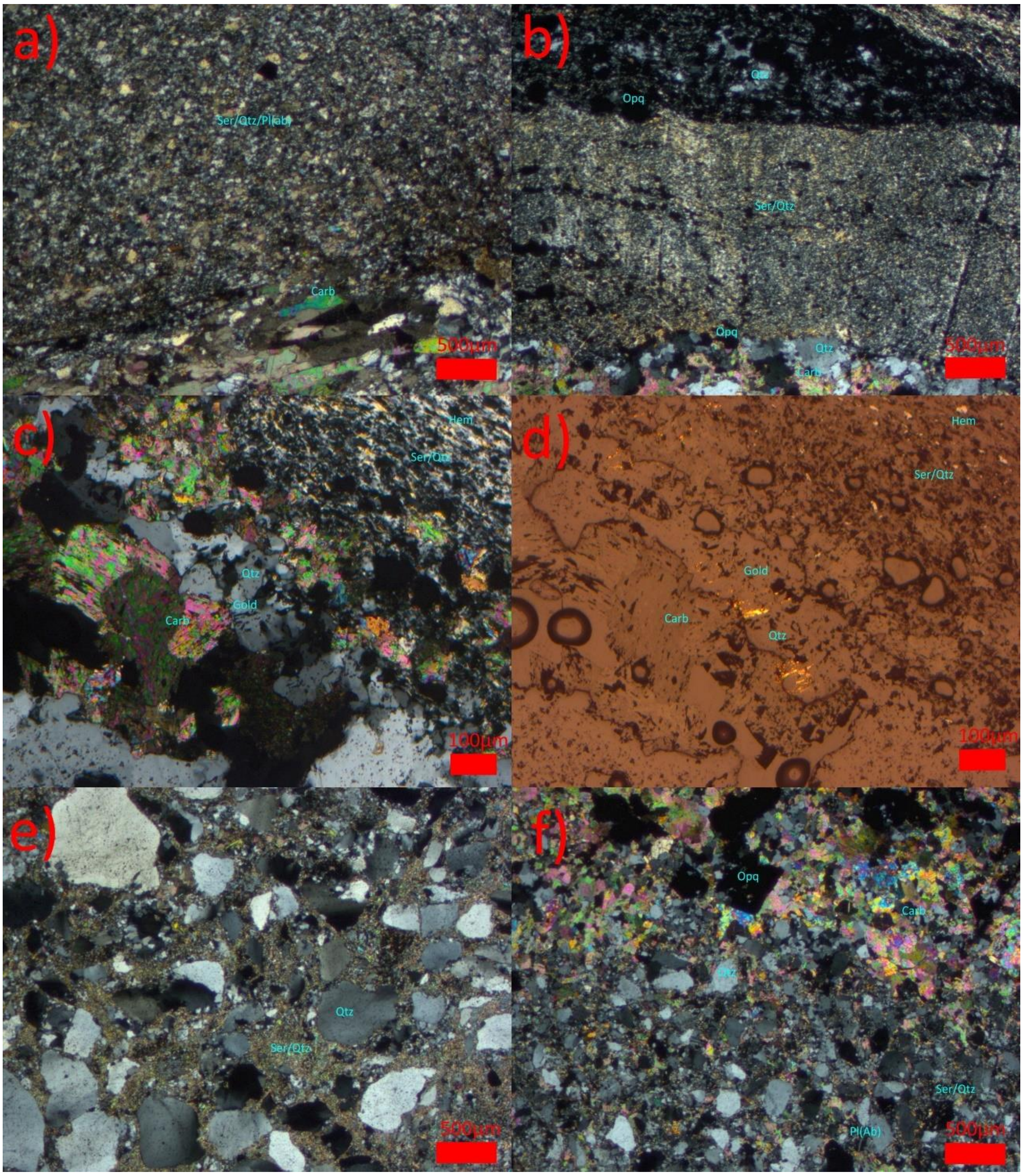


Figure 6. Thin section photomicrographs in crosses polarized light except Figure 9d in reflected light: a) 120100_A. Fine grained sericite-quartz-albite matrix and carbonate vein; b) 120112_A. Very fine grained sericite-quartz matrix between two carbonate-quartz vein; c) and d) 120112_A. Gold in quartz-carbonate vein. Fine hematite grains in sericite-quartz matrix; e) 120112_B. Coarse quartz grains in very fine grained sericite-quartz matrix; f) 120112_C Fine quartz and plagioclase (albite) grains in very fine grained sericite-quartz matrix and carbonate vein with opaque grains. Carb: Carbonate, Hem: Hematite, Opq: Opaque, Pl(ab): Plagioclase(albite), Qtz: Quartz, Ser: Sericite

6.2. U-Pb dating

Isoplot program (Ludwig, 2003) was used for data processing and age calculations. The age histograms were made for Probability Density Plot - function of Isoplot program. The plot included only concordant $^{207}Pb/^{206}Pb$ ages and their errors between 95-105% concordant-%. Analyses with high common lead content and points which contain too many inclusions were deleted. The pikes of histograms are indicating the most likely age clusters of the samples. SEM-images were taken from every zircon grain and from those images morphology of each zircon grain can be studied.

120059_A

The sample is representing conglomerate unit located within the central part of the Ikkari deposit. Detrital zircon grains are mostly subrounded or rounded and subhedral (Appendix 2). Totally 105 zircon grains were analyzed of which 19 were excluded from the age calculations due to a high common lead content or other errors. A major age population of the sample is Proterozoic and occur ca. 2015 Ma (Figure 7). The youngest age population of the sample is ca. 1910 Ma. A minor Archean age population occur ca. 2730 Ma. The sample has 24% Archean ages varying between 2500-2959 Ma and 76% Proterozoic ages varying between 1895-2484 Ma (Figure 8). Maximum deposition age of the sample is 1910 ± 10 based on the YC1σ (2+) method (Appendix 1). Concordia diagram of the sample is presented on figure 9.

120063_A

In this quartzite sample within western of the Ikkari deposit, zircon occurs mostly rounded and anhedral grains (Appendix 2). From total 102 analyzed zircon grains 17 were excluded from results because of a high common lead content or other bias. Ca.1920 Ma occurs major population of the sample (Figure 7). The youngest reliable age population of the sample occurs ca.1876 Ma. The second largest population of the sample occurs around 2010 Ma. Also, a minor Archean population occurs around 2700 Ma. The sample has 24 % Archean ages varying between 2580-3311 Ma and 76% Proterozoic ages varying between 1842-2481 Ma (Figure 8). Sample has the youngest single age (1842 Ma) from all samples in this study. Maximum deposit age of the sample is 1847 ± 5 Ma based on YC1σ (2+) method (Appendix 1). Concordia diagram of the sample is presented on Figure 9.

120071_A

In the conglomerate sample within central part of the Ikkari deposit zircon grains are mostly subrounded and partly euhedral (Appendix 2). Totally 101 zircon grains were analyzed of which 12 grains showed a high common lead content or other bias and were therefore excluded from the age calculations. The major age population in the sample is dated to ca. 2015 Ma (Figure 7). Also two minor populations occur close to that date, a younger around 1940 Ma and the older around 2120 Ma. A minor Archean population occur around 2730 Ma. 72% of ages of the sample are Proterozoic varying between 1913-2490 Ma and rest of the ages are Archean varying between 2694-3585 Ma (Figure 8). This sample has the oldest single age (3585 Ma) from all ages of this study. Maximum deposit age of this sample is 1919 ± 5 Ma based on YC1σ (2+) method (Appendix 1). Concordia diagram of the sample is presented on Figure 9.

120074B_A

The sample is representing quartzite unit located within the central part of the Ikkari deposit. Zircon grains are mostly rounded or subrounded and anhedral (Appendix 2). A total of 106 grains were analyzed, but because 16 grains contained excess common lead or other errors, 90 grains were taken into account in the age calculations. The major population of sample occur around 1945 Ma (Figure 7). Only two other notable populations occur in the sample, around 2100 Ma and an Archean population around 2750 Ma. In the sample occur only 11% Archean ages varying between 2515-3051 Ma and rest 89% are Proterozoic ages varying between 1881-2336 Ma (Figure 8). Maximum deposit age of this sample is 1894 ± 7 Ma based on YC1σ (2+) method (Appendix 1). Concordian diagram of the sample is presented on Figure 9.

120094&120097_A

Almost all zircon grains in the quartzite sample within the central of the Ikkari deposit are rounded or subrounded and most of them are anhedral (Appendix 2). 11 zircon grains from total of 106 grains were excluded due to high common lead content or other bias. Around 1930 Ma occur major population of the sample (Figure 7). Two minor populations occur around 1880 Ma and around 2000 Ma. A minor Archean population occur around 2770 Ma. The sample has 15% Archean ages varying between 2563-3108 Ma and 85% Proterozoic ages varying between 1862-2473Ma (Figure 8). Based on YC1σ (2+) method, maximum deposition age is 1868 ± 4 Ma (Appendix 1). Concordia diagram of the sample is presented on Figure 9.

120098_A

Zircon grains in the quartzite sample within northern part of the Ikkari deposit are mostly rounded or subrounded and subhedral (Appendix 2). Totally 107 zircon grains were analyzed of which 27 grains showed a high common lead content or other errors and were excluded from the age calculations. The major populations of sample are Proterozoic and occur around 1905 Ma and 1995 Ma (Figure 7). The minor populations occur around 2110 Ma and an Archean around 2670 Ma. The Proterozoic ages vary between 1886-2367 Ma formed 87% of all ages of the sample and rest 13% are Archean ages which vary between 2553-3230 Ma (Figure 8). Maximum deposition age of the sample is 1896 ± 3 Ma based on YC1σ (2+) method (Appendix 1). Concordia diagram of the sample is presented on Figure 10.

120100_A

Most zircon grains of the quartzite sample within central of the Ikkari deposit are subrounded and subhedral (Appendix 2). A total of 110 grains were analyzed, and because 21 grains contained excess common lead or have other errors, 89 grains were considered in the age calculations. In the sample the major population occur around 1920 Ma (Figure 7). A minor Proterozoic population occur around 2020 Ma and two minor Archean populations occur around 2535 Ma and 2735 Ma. 20% of the ages are Archean varying between 2532-3302 Ma and 80% are Proterozoic varying between 1853-2488 Ma (Figure 8). Maximum deposition age of this sample is 1860 ± 4 Ma based on YC1σ (2+) method (Appendix 1). Concordia diagram of the sample is presented on Figure 10.

120112_B

The quartzite sample within northern part of the Ikkari deposit contain mostly rounded or subrounded and anhedral zircon grains (Appendix 2). Totally 101 zircon grains were analyzed of which 25 grains showed a high common lead content or other errors and were excluded from the age calculations. The major population of the sample occur around 1910 Ma and the only other notable population in the sample occur 2030 Ma (Figure 7). The Proterozoic ages varying 1874-2383 Ma formed 88 % of all ages and rest 12 % are Archean varying between 2602-3258 Ma (Figure 8). 1875 ± 6 Ma is inferred maximum deposition age of the sample, based on YC1σ (2+) method (Appendix 1). Concordia diagram of the sample is presented on Figure 10.

120112_C

The most zircon grains of the quartzite sample within northern part of the Ikkari deposit are rounded or subrounded and anhedral (Appendix 2). 24 zircon grains from total of 100 grains were excluded due to high common lead content or other bias. The major population of this sample occur around 1920 Ma (Figure 7). Three minor older Proterozoic populations occur around 1995 Ma, 2050 Ma and 2100 Ma. There also occur an Archean population around 2765 Ma. 17% of the ages are Archean varying between 2619-3254 Ma and rest 83 % are Proterozoic varying between 1850-2455 Ma (Figure 8). Maximum deposition age of this sample is 1885 ± 5 Ma based on YC1σ (2+) method (Appendix 1). Concordia diagram of the sample is presented on Figure 10.

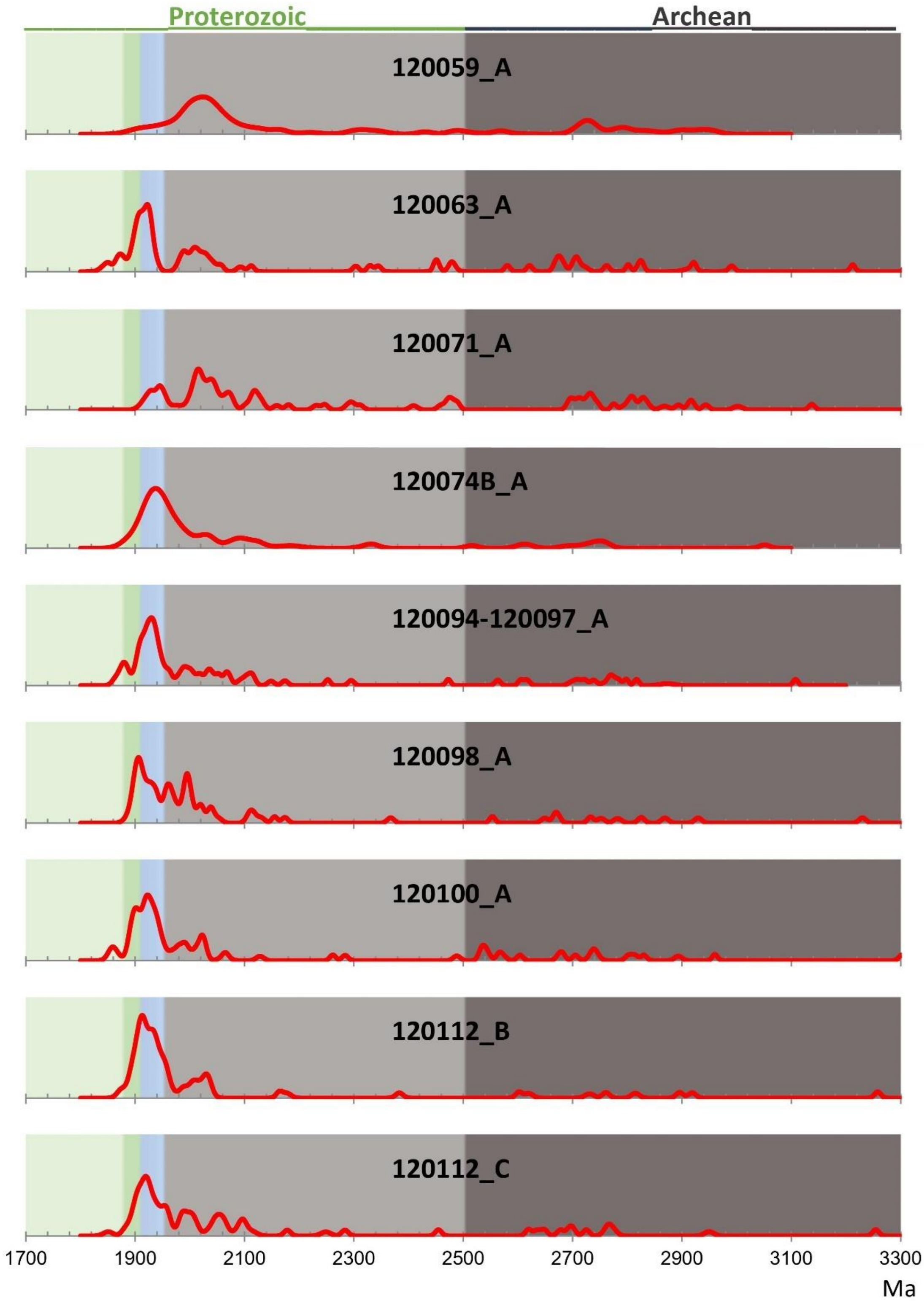


Figure 7. Probability density plots of detrital zircon $^{206}Pb/^{207}Pb$ ages of samples. Zircon grains with < 10% central discordancy were accepted for the probability density diagrams. Relative probability on the y-axis is 0-0.015. Relative probability is higher when there are more other age points close to the age. On the x-axis is timeframe from

1700 to 3300 Ma. Colors of the graphs represent times < 1.88, 1.88–1.91, 1.91–1.96, 1.96–2.50, and > 2.50 Ga from left to right.

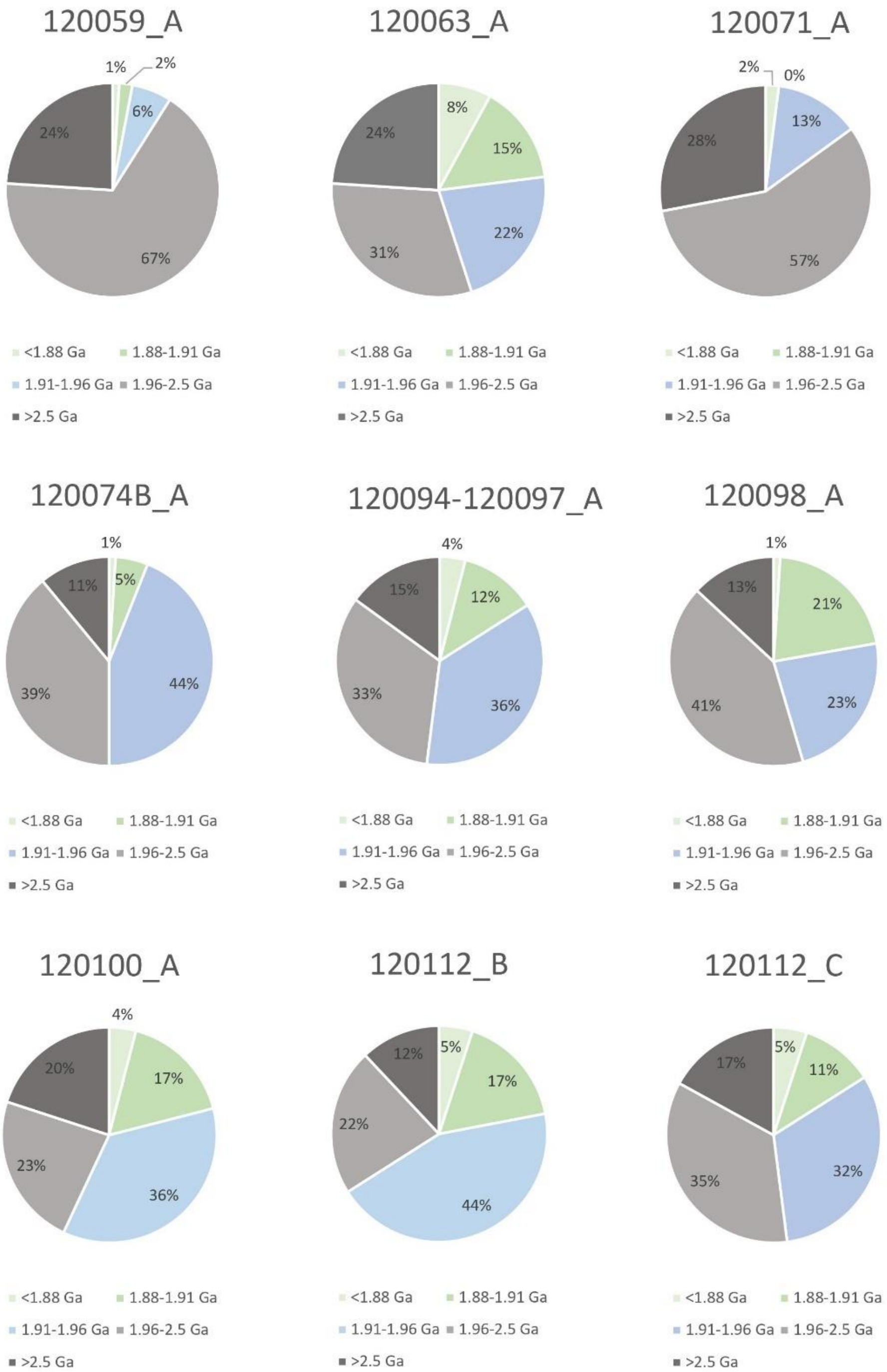


Figure 8. Pie charts represents age group distribution of the analytical results in %, which are divided into < 1.88, 1.88–1.91, 1.91–1.96, 1.96–2.50, and > 2.50 Ga.

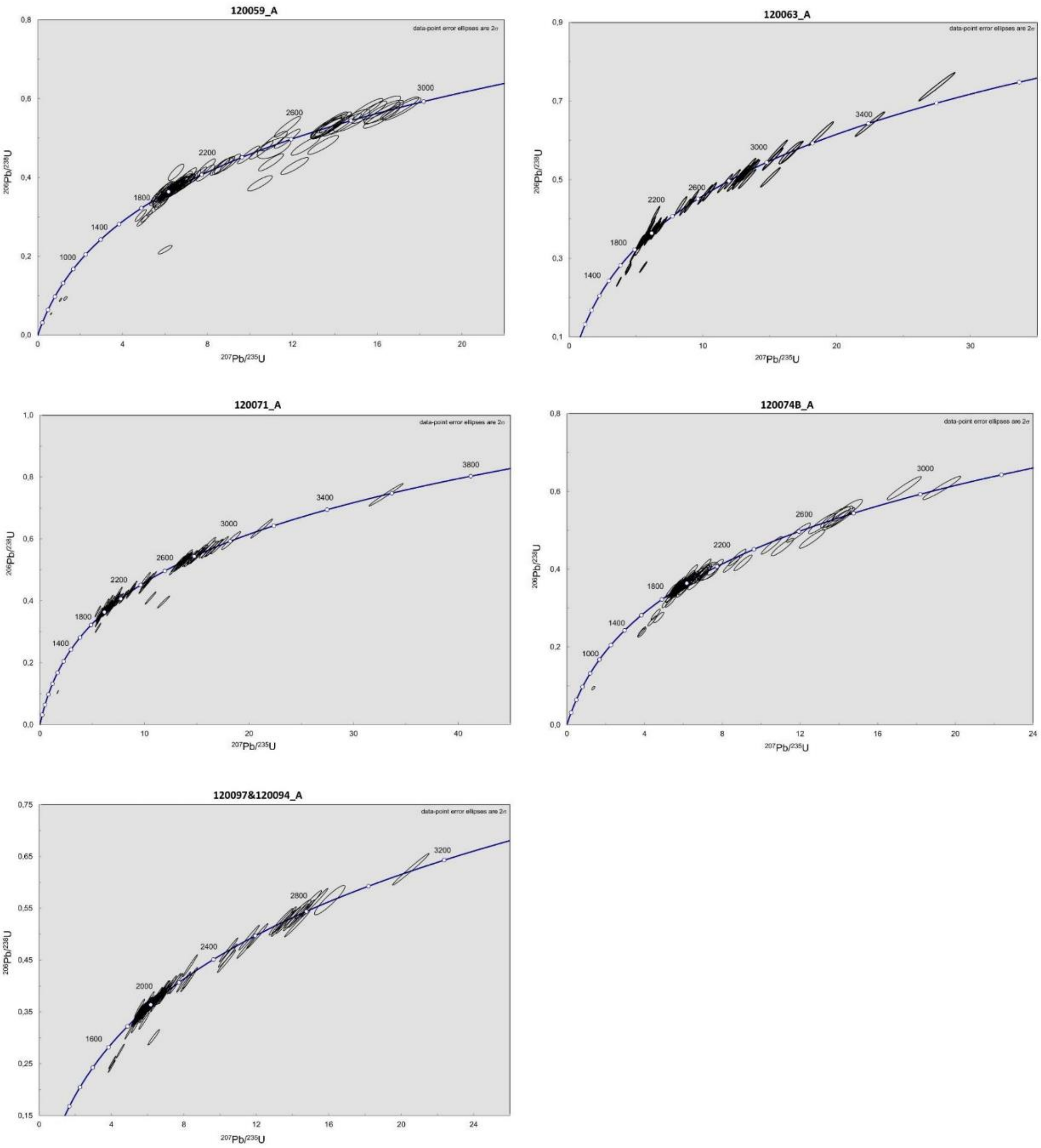


Figure 9. U-Pb concordia diagrams showing dating results with error ellipses of the analyses. Larger ellipses correspond to larger error or smaller probability density.

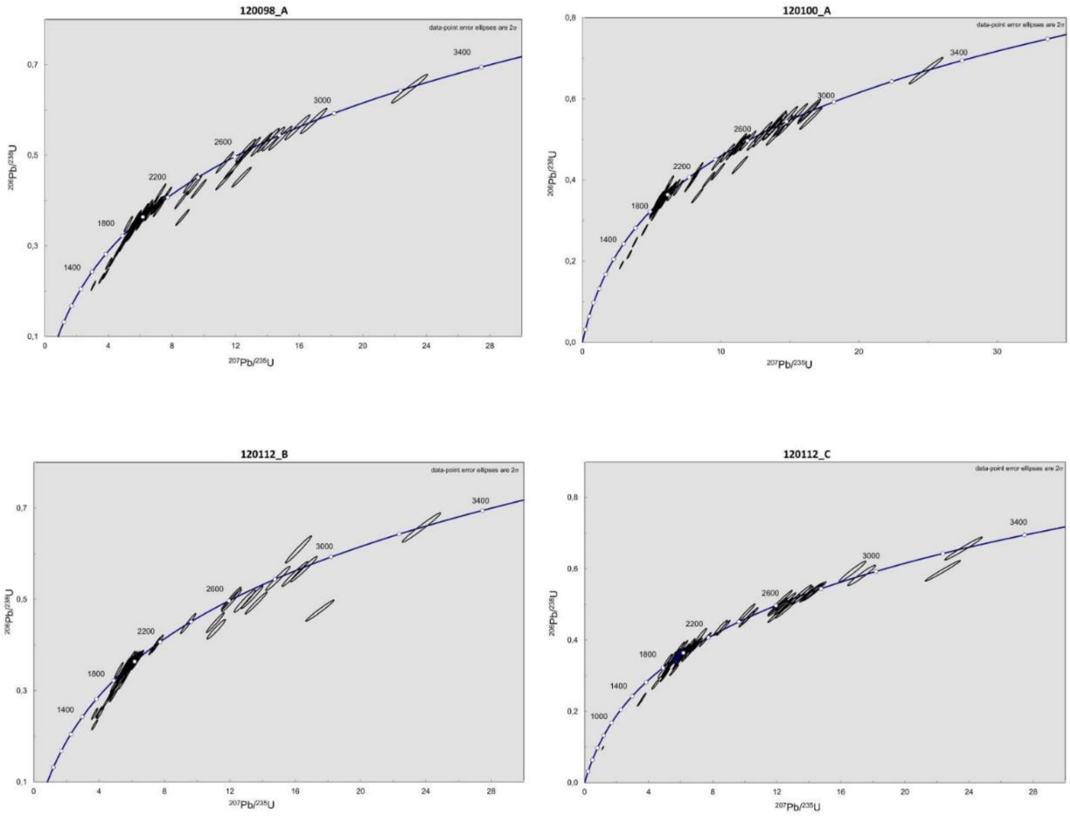


Figure 10. U-Pb concordia diagrams showing dating results with error ellipses of the analyses. Larger ellipses correspond to larger error or smaller probability density.

7. DISCUSSION

The true deposition age of the sedimentary rocks is challenging to determine due to the variable material sources and lack of high temperature processes which would produce suitable primary minerals for geochronological studies, as is the case in the magmatic or metamorphic rocks. Thus, we can only infer indirect evidences of timing of the deposition, collected from detrital mineral grains, such as zircons. Maximum age determination of the sedimentation based on the youngest zircon populations in the sediments, is commonly used (e.g. Köykkä et al., 2019). Determination of the maximum age is not always straightforward as zircon radiogenic system is often opened at some point of its history and lead to partial lead loss, and therefore they can seem younger than what they really are. If analytical errors are large, these zircons which lose lead can remain to concordia diagram. Also, high amount of common lead affects uncertainty to results because correct amount of common lead is challenging to estimate. Models are being used to determine the amount of common lead.

Köykkä et al. (2019) provided comprehensive summary of evolution of the Paleoproterozoic supracrustal units within the Fennoscandian shield. Among others, Kumpu group rocks and their detrital zircon characteristics, representing the youngest sedimentary strata in these supracrustal unit, were discussed. One peculiarities of the detrital zircon population found from the Kumpu group rocks, is the age population between 2.25-2.22 Ga. This age range can be only found from the Kumpu group rocks and it is believed to represent period of tectono-magmatic lull or shutdown, characterized by the decreasing activity of global-scale magmatism and orogenic activity (Köykkä et al., 2019 and references therein). Only after the onset of the thrust belt development during the Svecofennian orogeny, zircon ages of the 2.3-2.2 Ga appear to the sedimentary material within the supracrustal belts. In this study, the samples analyzed was found to contain zircon population representing this period of tectono-magmatic shutdown. Samples are containing age populations between 2.05-2.00 Ga. According to the Köykkä et al., (2019), coeval felsic porphyries and mafic intrusions of this age within the Central Lapland belt (Kittilä suite and Savukoski group) is probably the local source for the sedimentary material of this age. All other samples expect 120059_A and 120071_A are altered quartzites and their major population occur between 1945-1905 Ma. Zircon populations of these ages found in this study are reported also in previous studies within the supracrustal units (Ranta et al., 2015; Köykkä et al., 2019). The felsic magmatism in the Lapland Granulite belt is potential source for the material of this age.

The youngest detrital zircon populations in this current study falls between 1.9-1.86 Ga. This age group is represented widely in the northern Fennoscandia by voluminous felsic plutonic rocks and similar ages are found in the Kumpu group rocks and matching units within the other supracrustal belts (see Köykkä et al., 2019).

Samples 120059_A and 120071_A represents conglomeratic rocks. These two samples have slightly older major population than other samples, around 2015 Ma and their maximum deposit ages are 1910 ± 10 Ma (120059_A) and 1919 ± 5 Ma (120071_A). Conglomerates seem to lack the age population <1.90 Ga which seems to indicate the deposition earlier compared to the quartzitic rocks.

According Lahtinen et al., (2015), the zircon ages 1.89-1.88 Ga are problematic difficulty proofing if zircons are detrital or metamorphic in origin. Lahtinen et al., (2015), interpreted in their study, zircon population between 1.86-1.85 Ga as metamorphic because zircons have abundant metamorphic overgrowths. This metamorphic event has also been recorded in the Masugnsbyn area located in west of Pajala (Bergman et al., 2006). According to Lahtinen et al., (2015), there probably has been some metamorphic overgrowth of zircons also between 1.92-1.90 Ga. In this study, some zircon grains show clearly bimodal age distribution between core and rim, with core yielding older, Archean ages and rims younger ~1.93-1.90 Ga ages (Figure 11). In these cases, the zircons are clearly showing metamorphic overgrowth and cannot be interpreted to be from primary source.

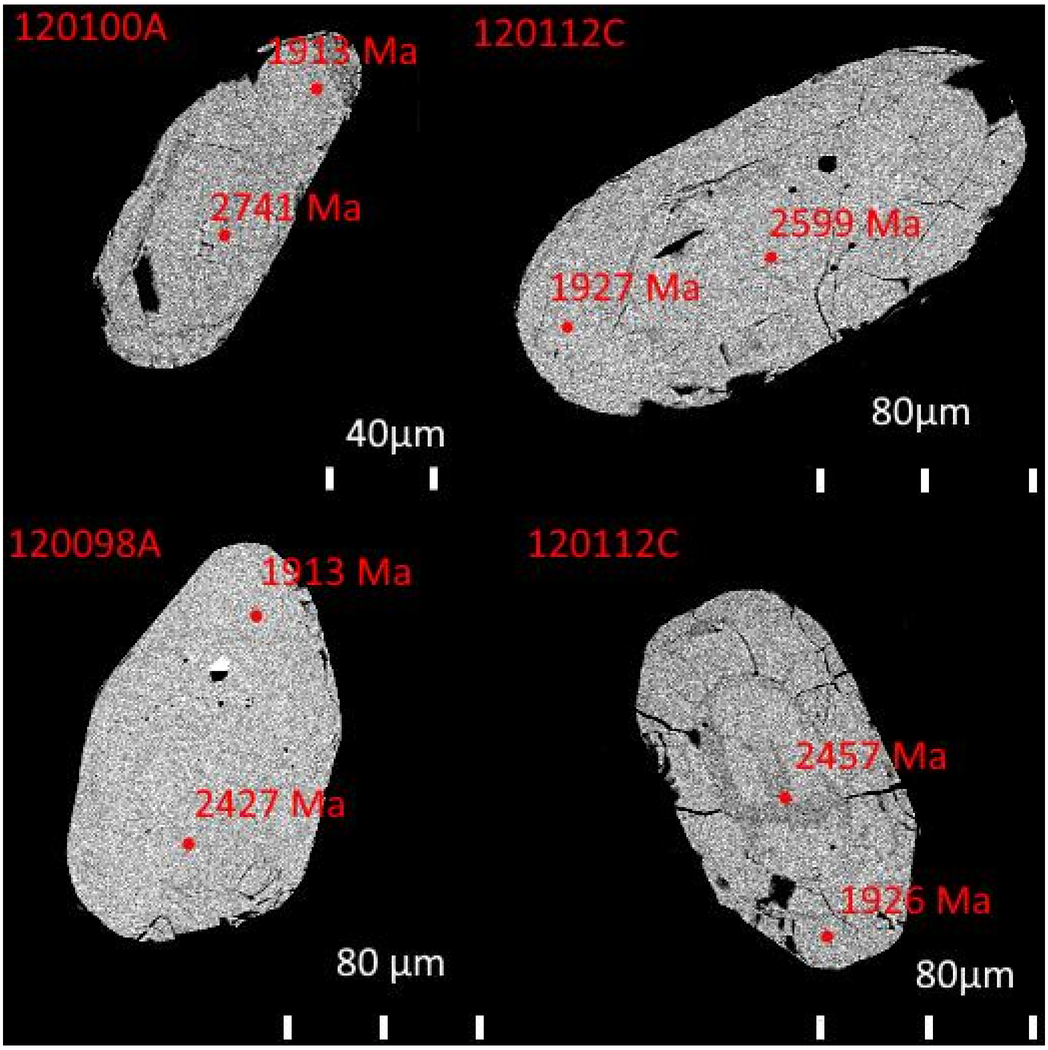


Figure 11. The two different ages points from each zircon grain which have circumferential structure. One age is from the centrum of the grain and another one is from the rim of the grain. Ages from the rims are probably metamorphic ages due to metamorphic overgrowths.

Overall, Comparing the overview of the geochronological studies represented by Köykkä et al., (2019), samples in this study are comparable to the Kumpu group metasedimentary rocks and therefore, overall results of this study shows that the studied metasedimentary units within the Ikkari deposits can be correlated with the Kumpu group, the youngest sedimentary unit in the Central Lapland belt.

The metasedimentary samples in this study are situated within the Ikkari gold deposit. Gold deposition is clearly epigenetic in origin as it is characterized by structurally controlled gold in highly sheared rocks with interlayered package of altered ultramafics and metasedimentary rocks which seem to be hydrothermally altered after peak metamorphism (J-P Ranta, personal communication 2022). According to Molnar (2021) most of the gold deposited at the late- to post-orogenic stages in all Svecofennian provinces between 1.82-1.75 Ga. This is a common age of the gold in other Paleoproteroszoic supracrustal belts in Fennoscandia (e.g. Ranta et al., 2018). Older ages for gold ore-formation have been reported from the Central Lapland belt. For example, the Suurikuusikko deposit in Central Lapland belt shows age of 1916 ± 19 Ma for gold bearing arsenopyrite (Wyche et al., 2015). This would imply that some of the gold was deposited during/before the sedimentation of the Kumpu group rocks. Age of the Ikkari Au deposition is not yet fully understood. Preliminary geochronological data implies late-orogenic timing (Ranta, unpublished). However, the true age distribution and possible multistage mineralization processes of the Ikkari are yet to be unraveled.

8. CONCLUSIONS

The samples represent altered quartzites and conglomerates. The conglomerate samples seem to be slightly older than the other samples in this study. Based on U-Pb ages of the detrital zircon populations of this study, samples can be correlated in to the Kumpu group, the youngest sedimentary unit in the Central Lapland belt.

9. ACKNOWLEDGEMENTS

I would like to thank for the following people helping me during the thesis project:

- My supervisor Jukka-Pekka Ranta for guiding me through this study.

- Charlotte Seabrook and personnel of Rupert Resources for giving the subject to me and helping through this project.

- Matti Kurhila from GTK for doing sample preparations and giving good advices to handling the results.

- My fellow students for giving me unforgettable student years.

- Maria and my family for support and encouragement to finish the Master thesis.

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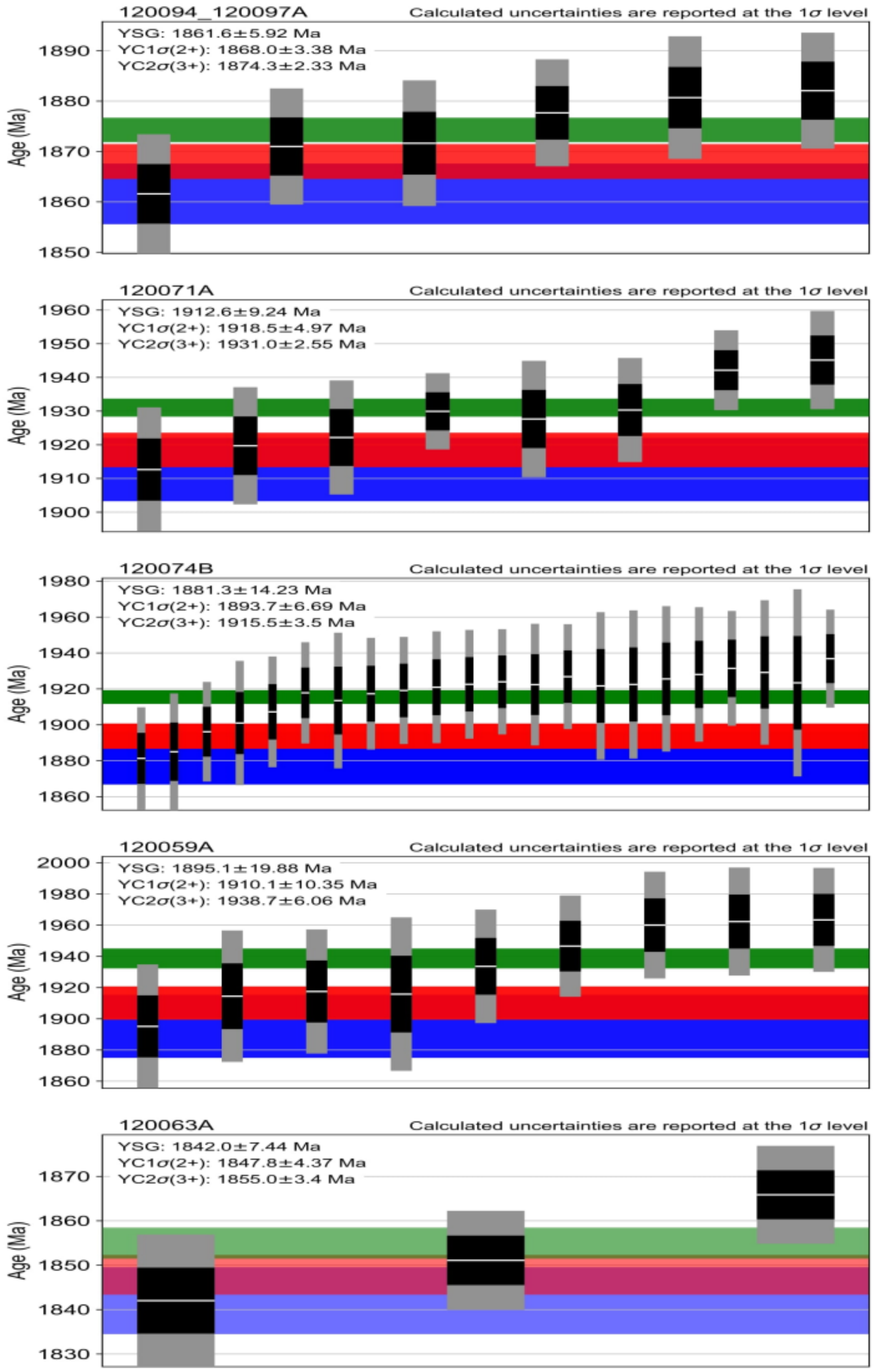
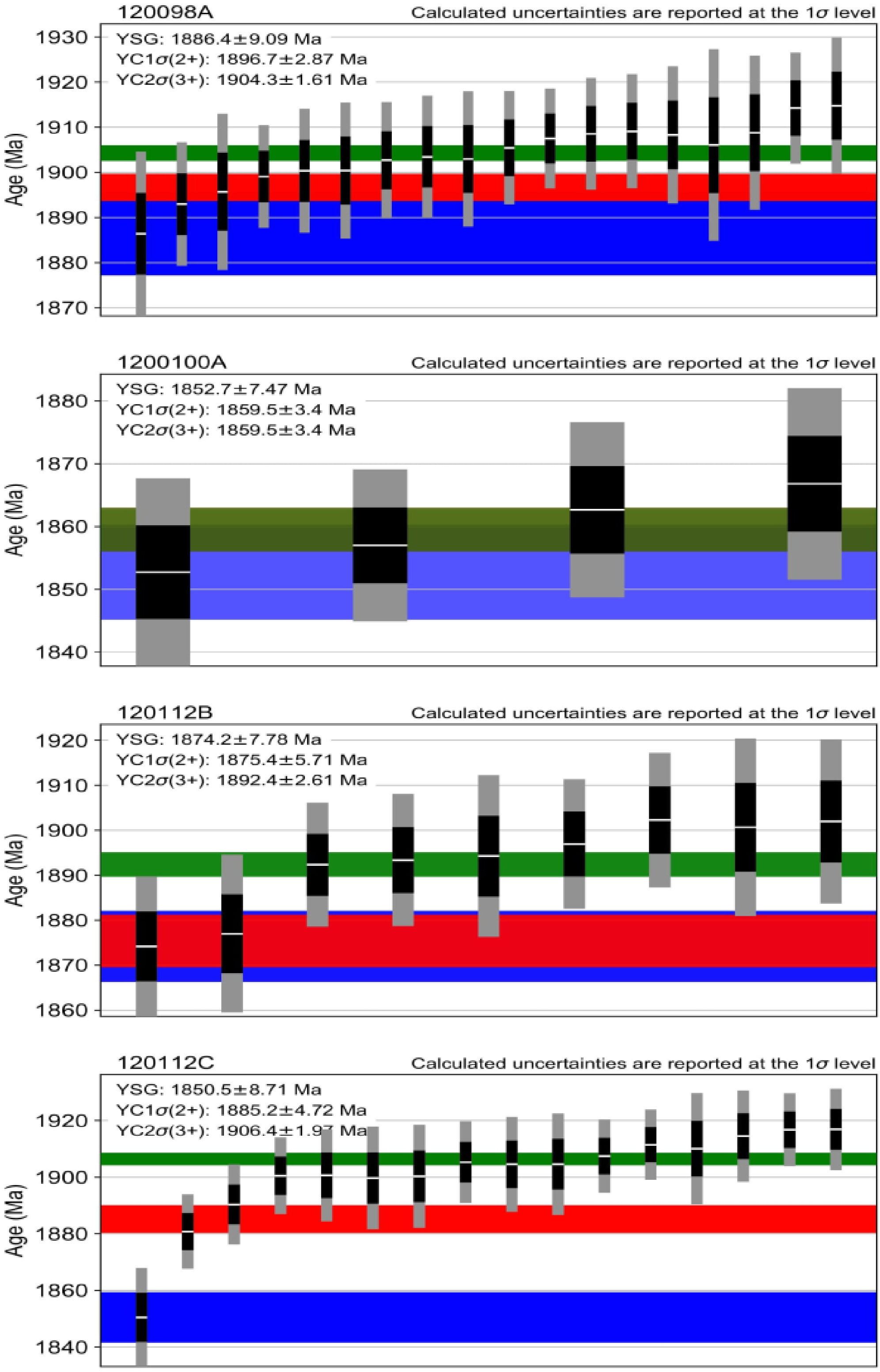
APPENDICES

Appendix 1(1). Result of maximum deposition age calculations.



Appendix 1(2). Result of maximum deposition age calculations.



Appendix 2(1) Morphology of the zircon grains

Sample ID	Description	Euhedral or not	Size	Sample ID	Description	Euhedral or not	Size
120059A_01	Angular	Euhedral	Medium	120059A_54	Rounded		Medium
120059A_02	Subrounded		Medium	120059A_55	Subrounded	Euhedral	Medium
120059A_03	Rounded		Medium	120059A_56	Rounded		Small
120059A_04	Subrounded		Large	120059A_57	Angular		Small
120059A_05	Subrounded		Medium	120059A_58	Angular		Medium
120059A_06	Subrounded		Small	120059A_59	Subrounded		Medium
120059A_07	Rounded		Medium	120059A_60	Subrounded		Medium
120059A_08	Subrounded		Medium	120059A_61	Subrounded		Medium
120059A_09	Rounded		Small	120059A_62	Angular	Euhedral	Medium
120059A_10	Subrounded		Medium	120059A_63	Subrounded		Medium
120059A_11	Angular		Small	120059A_64	Rounded		Small
120059A_12	Angular		Medium	120059A_65	Subrounded		Medium
120059A_13	Rounded		Medium	120059A_66	Subrounded		Medium
120059A_14	Rounded		Medium	120059A_67	Angular		Medium
120059A_15	Subrounded		Medium	120059A_68	Rounded		Medium
120059A_16	Rounded		Large	120059A_69	Subrounded		Medium
120059A_17	Subrounded		Small	120059A_70	Subrounded		Medium
120059A_18	Subrounded		Medium	120059A_71	Subrounded		Small
120059A_19	Subrounded	Euhedral	Small	120059A_72	Rounded		Small
120059A_20	Rounded		Medium	120059A_73	Rounded		Small
120059A_21	Subrounded		Small	120059A_74	Subrounded	Euhedral	Medium
120059A_22	Subrounded		Medium	120059A_75	Subrounded		Small
120059A_23	Subrounded		Small	120059A_76	Subrounded	Euhedral	Medium
120059A_24	Angular		Medium	120059A_77	Rounded	Euhedral	Medium
120059A_25	Subrounded		Medium	120059A_78			
120059A_26	Subrounded		Small	120059A_79	Subrounded	Euhedral	Medium
120059A_27	Angular		Medium	120059A_80	Angular		Small
120059A_28	Rounded		Small	120059A_81	Subrounded		Medium
120059A_29	Rounded		Medium	120059A_82	Subrounded	Euhedral	Medium
120059A_30	Subrounded		Medium	120059A_83	Rounded		Small
120059A_31	Angular		Medium	120059A_84	Subrounded		Small
120059A_32	Angular		Medium	120059A_85	Angular	Euhedral	Medium
120059A_33	Angular		Medium	120059A_86	Rounded		Medium
120059A_34	Rounded		Medium	120059A_87	Rounded		Medium
120059A_35	Rounded		Small	120059A_88	Subrounded		Medium
120059A_36	Rounded		Small	120059A_89	Subrounded	Euhedral	Medium
120059A_37	Angular	Euhedral	Small	120059A_90	Subrounded		Small
120059A_38	Rounded		Large	120059A_91	Subrounded		Large
120059A_39	Subrounded		Medium	120059A_92	Angular		Large
120059A_40	Subrounded	Euhedral	Medium	120059A_93	Subrounded		Medium
120059A_41	Subrounded		Medium	120059A_94	Angular		Small
120059A_42	Angular		Small	120059A_95	Subrounded		Small
120059A_43	Rounded		Medium	120059A_96	Angular		Small
120059A_44	Angular		Small	120059A_97	Subrounded		Small
120059A_45	Subrounded		Medium	120059A_98	Subrounded		Medium
120059A_46	Angular		Small	120059A_99	Angular		Medium
120059A_47	Subrounded	Euhedral	Large	120059A_100	Subrounded		Small
120059A_48	Subrounded		Medium	120059A_101	Subrounded		Medium
120059A_49	Subrounded	Euhedral	Medium	120059A_102	Subrounded		Medium
120059A_50	Rounded		Medium	120059A_103	Angular	Euhedral	Medium
120059A_51	Subrounded	Euhedral	Small	120059A_104	Subrounded		Medium
120059A_52	Rounded		Medium	120059A_105	Subrounded		Medium
120059A_53	Rounded		Medium				

Appendix 2(2) Morphology of the zircon grains.

Sample ID	Description	Euhedral or not	Size	Sample ID	Description	Euhedral or not	Size
120063A_01	Subrounded	Euhedral	Small	120063A_53	Rounded		Large
120063A_02	Angular	Euhedral	Medium	120063A_54	Subrounded		Medium
120063A_03	Subrounded	Euhedral	Medium	120063A_55	Subrounded		Small
120063A_04	Rounded		Medium	120063A_56	Subrounded	Euhedral	Medium
120063A_05	Rounded		Medium	120063A_57	Subrounded	Euhedral	Large
120063A_06	Angular	Euhedral	Medium	120063A_58	Rounded		Medium
120063A_07	Subrounded		Medium	120063A_59	Subrounded	Euhedral	Medium
120063A_08	Rounded		Small	120063A_60	Rounded		Medium
120063A_09	Angular	Euhedral	Medium	120063A_61	Rounded		Small
120063A_10	Rounded		Medium	120063A_62	Subrounded		Medium
120063A_11	Rounded		Medium	120063A_63	Subrounded		Medium
120063A_12	Rounded		Medium	120063A_64	Subrounded	Euhedral	Medium
120063A_13	Rounded	Euhedral	Small	120063A_65	Rounded	Euhedral	Small
120063A_14	Subrounded		Medium	120063A_66	Subrounded		Medium
120063A_15	Rounded		Medium	120063A_67	Rounded		Medium
120063A_16	Rounded		Medium	120063A_68	Rounded		Large
120063A_17	Rounded		Large	120063A_69	Rounded		Medium
120063A_18	Rounded		Medium	120063A_70	Angular		Medium
120063A_19	Subrounded	Euhedral	Medium	120063A_71	Rounded		Medium
120063A_20	Angular		Small	120063A_72	Angular		Medium
120063A_21	Subrounded	Euhedral	Medium	120063A_73	Subrounded		Medium
120063A_22	Rounded		Small	120063A_74	Rounded		Medium
120063A_23	Rounded		Medium	120063A_75	Rounded		Medium
120063A_24	Subrounded	Euhedral	Medium	120063A_76	Angular		Small
120063A_25	Angular	Euhedral	Medium	120063A_77	Subrounded	Euhedral	Small
120063A_26	Subrounded		Small	120063A_78	Rounded		Small
120063A_27	Rounded		Medium	120063A_79	Subrounded		Small
120063A_28	Rounded	Euhedral	Medium	120063A_80	Rounded		Medium
120063A_29	Subrounded	Euhedral	Medium	120063A_81	Subrounded		Small
120063A_30	Angular		Small	120063A_82	Subrounded	Euhedral	Medium
120063A_31	Subrounded	Euhedral	Medium	120063A_83	Subrounded	Euhedral	Medium
120063A_32	Rounded		Medium	120063A_84	Rounded		Medium
120063A_33	Angular		Medium	120063A_85	Rounded		Large
120063A_34	Rounded		Medium	120063A_86	Subrounded	Euhedral	Medium
120063A_35	Subrounded	Euhedral	Small	120063A_87	Subrounded		Small
120063A_36	Angular		Small	120063A_88	Subrounded		Medium
120063A_37	Angular		Medium	120063A_89	Subrounded		Medium
120063A_38	Subrounded		Medium	120063A_90	Angular	Euhedral	Large
120063A_39	Subrounded	Euhedral	Medium	120063A_91	Subrounded		Medium
120063A_40	Subrounded		Small	120063A_92	Subrounded		Medium
120063A_41	Subrounded	Euhedral	Medium	120063A_93	Rounded		Large
120063A_42	Subrounded		Small	120063A_94	Angular		Medium
120063A_43	Rounded		Small	120063A_95	Subrounded		Medium
120063A_44	Rounded		Medium	120063A_96	Rounded		Medium
120063A_45	Angular		Medium	120063A_97	Rounded		Large
120063A_46	Subrounded	Euhedral	Medium	120063A_98	Rounded		Small
120063A_47	Rounded		Large	120063A_99	Subrounded		Medium
120063A_48	Subrounded		Medium	120063A_100	Rounded		Small
120063A_49	Rounded	Euhedral	Medium	120063A_101	Subrounded		Small
120063A_50	Rounded	Euhedral	Medium	120063A_102	Subrounded		Small
120063A_51	Rounded		Medium				
120063A_52	Rounded	Euhedral	Medium				

Appendix 2(3) Morphology of the zircon grains.

Sample number	Description	Euhedral or not	Size	Sample number	Description	Euhedral or not	Size
120071A_01	Angular		Medium	120071A_52	Subrounded	Euhedral	Medium
120071A_02	Subrounded	Euhedral	Medium	120071A_53	Subrounded		Small
120071A_03	Angular	Euhedral	Medium	120071A_54	Angular		Medium
120071A_04	Rounded		Medium	120071A_55	Angular	Euhedral	Medium
120071A_05	Angular	Euhedral	Small	120071A_56	Subrounded		Small
120071A_06	Subrounded	Euhedral	Small	120071A_57	Subrounded	Euhedral	Small
120071A_07	Rounded		Small	120071A_58	Rounded		Medium
120071A_08	Rounded		Medium	120071A_59	Subrounded	Euhedral	Small
120071A_09	Angular		Small	120071A_60	Angular	Euhedral	Small
120071A_10	Angular		Medium	120071A_61	Angular	Euhedral	Medium
120071A_11	Subrounded		Small	120071A_62	Rounded		Medium
120071A_12	Subrounded	Euhedral	Small	120071A_63	Angular		Medium
120071A_13	Subrounded	Euhedral	Medium	120071A_64	Angular	Euhedral	Large
120071A_14a	Subrounded	Euhedral	Medium	120071A_65	Angular		Small
120071A_14b	Rim	Euhedral	Medium	120071A_66	Angular		Medium
120071A_15	Subrounded		Medium	120071A_67	Angular		Small
120071A_16	Angular		Small	120071A_68a	Subrounded	Euhedral	Medium
120071A_17	Angular		Medium	120071A_68b	Rim		Medium
120071A_18	Subrounded	Euhedral	Medium	120071A_69	Angular		Medium
120071A_19	Subrounded	Euhedral	Medium	120071A_70	Angular	Euhedral	Small
120071A_20	Angular		Medium	120071A_71	Subrounded		Medium
120071A_21	Angular	Euhedral	Small	120071A_72	Subrounded		Medium
120071A_22	Subrounded	Euhedral	Small	120071A_73	Subrounded		Medium
120071A_23	Subrounded	Euhedral	Small	120071A_74	Subrounded		Medium
120071A_24	Subrounded		Small	120071A_75	Rounded		Medium
120071A_25	Angular	Euhedral	Medium	120071A_76	Rounded		Small
120071A_26	Subrounded		Small	120071A_77	Subrounded		Small
120071A_27	Subrounded		Medium	120071A_78	Subrounded		Medium
120071A_28	Subrounded	Euhedral	Medium	120071A_79	Angular		Medium
120071A_29	Subrounded	Euhedral	Small	120071A_80	Subrounded		Medium
120071A_30	Subrounded	Euhedral	Small	120071A_81	Subrounded		Medium
120071A_31	Subrounded		Medium	120071A_82	Rounded		Medium
120071A_32	Subrounded		Medium	120071A_83	Subrounded		Small
120071A_33	Subrounded	Euhedral	Small	120071A_84	Subrounded	Euhedral	Medium
120071A_34	Angular		Small	120071A_85	Subrounded		Large
120071A_35	Angular		Medium	120071A_86	Subrounded	Euhedral	Medium
120071A_36	Rounded		Small	120071A_87	Subrounded		Medium
120071A_37	Subrounded	Euhedral	Medium	120071A_88	Subrounded	Euhedral	Medium
120071A_38	Subrounded		Large	120071A_89	Rounded		Medium
120071A_39a	Angular	Euhedral	Large	120071A_90	Angular		Medium
120071A_39b	Rim		Large	120071A_91	Angular	Euhedral	Small
120071A_40	Angular		Medium	120071A_92	Subrounded		Medium
120071A_41	Subrounded		Small	120071A_93	Angular	Euhedral	Medium
120071A_42	Subrounded		Small	120071A_94	Angular	Euhedral	Medium
120071A_43	Angular		Medium	120071A_95	Subrounded		Small
120071A_44	Rounded		Medium	120071A_96	Subrounded	Euhedral	Medium
120071A_45	Rounded		Medium	120071A_97	Subrounded		Small
120071A_46	Subrounded		Medium	120071A_98	Rounded		Medium
120071A_47	Subrounded		Medium	120071A_99	Rounded		Medium
120071A_48	Subrounded		Small	120071A_100	Angular	Euhedral	Medium
120071A_49	Subrounded		Medium	120071A_101	Rounded		Medium
120071A_50	Angular	Euhedral	Medium				
120071A_51	Subrounded		Medium				

Appendix 2(4) Morphology of the zircon grains.

Sample ID	Description	Euhedral or not	Size	Sample ID	Description	Euhedral or not	Size
120074B-a_01a	Subrounded	Euhedral	Medium	120074B-a_54	Rounded		Medium
120074B-a_01b	Rim		Medium	120074B-a_55	Rounded		Small
120074B-a_02	Subrounded	Euhedral	Large	120074B-a_56	Rounded		Medium
120074B-a_03	Rounded		Medium	120074B-a_57	Rounded		Small
120074B-a_04	Subrounded		Medium	120074B-a_58	Rounded	Euhedral	Medium
120074B-a_05	Rounded		Small	120074B-a_59	Angular		Small
120074B-a_06	Subrounded		Large	120074B-a_60	Rounded		Medium
120074B-a_07	Subrounded	Euhedral	Small	120074B-a_61	Rounded		Medium
120074B-a_08	Rounded		Medium	120074B-a_62	Rounded		Small
120074B-a_09	Subrounded		Medium	120074B-a_63	Subrounded		Medium
120074B-a_10	Angular		Small	120074B-a_64	Rounded		Medium
120074B-a_11	Subrounded		Small	120074B-a_65	Rounded		Medium
120074B-a_12	Subrounded		Medium	120074B-a_66	Subrounded	Euhedral	Medium
120074B-a_13	Subrounded		Medium	120074B-a_67	Subrounded	Euhedral	Medium
120074B-a_14	Subrounded		Medium	120074B-a_68	Rounded		Medium
120074B-a_15	Rounded		Medium	120074B-a_69	Rounded		Medium
120074B-a_16	Subrounded		Medium	120074B-a_70	Subrounded		Medium
120074B-a_17	Subrounded		Medium	120074B-a_71	Subrounded		Medium
120074B-a_18	Subrounded	Euhedral	Large	120074B-a_72	Rounded		Medium
120074B-a_19	Subrounded		Medium	120074B-a_73	Subrounded	Euhedral	Medium
120074B-a_20	Rounded		Small	120074B-a_74	Rounded		Large
120074B-a_21	Angular		Medium	120074B-a_75	Rounded		Small
120074B-a_22	Subrounded		Small	120074B-a_76	Rounded		Small
120074B-a_23	Subrounded	Euhedral	Large	120074B-a_77	Subrounded		Medium
120074B-a_24	Rounded		Small	120074B-a_78	Rounded		Medium
120074B-a_25	Angular	Euhedral	Small	120074B-a_79	Subrounded		Medium
120074B-a_26	Rounded	Euhedral	Medium	120074B-a_80	Subrounded		Small
120074B-a_27	Subrounded	Euhedral	Medium	120074B-a_81	Subrounded		Medium
120074B-a_28	Rounded		Medium	120074B-a_82	Subrounded	Euhedral	Medium
120074B-a_29	Subrounded	Euhedral	Medium	120074B-a_83	Rounded	Euhedral	Large
120074B-a_30	Rounded	Euhedral	Large	120074B-a_84	Subrounded		Medium
120074B-a_31	Subrounded		Small	120074B-a_85	Rounded		Medium
120074B-a_32	Rounded	Euhedral	Medium	120074B-a_86	Subrounded		Medium
120074B-a_33	Subrounded	Euhedral	Medium	120074B-a_87	Rounded		Medium
120074B-a_34	Rounded		Medium	120074B-a_88	Rounded		Medium
120074B-a_35	Angular		Medium	120074B-a_89	Rounded		Medium
120074B-a_36	Rounded		Medium	120074B-a_90	Subrounded		Small
120074B-a_37	Subrounded	Euhedral	Medium	120074B-a_91	Rounded		Small
120074B-a_38	Rounded		Medium	120074B-a_92	Rounded		Small
120074B-a_39	Rounded		Medium	120074B-a_93	Rounded	Euhedral	Medium
120074B-a_40	Subrounded	Euhedral	Small	120074B-a_94	Rounded	Euhedral	Medium
120074B-a_41	Subrounded	Euhedral	Medium	120074B-a_95	Subrounded		Medium
120074B-a_42	Rounded		Medium	120074B-a_96	Rounded		Medium
120074B-a_43	Rounded		Small	120074B-a_97	Rounded	Euhedral	Medium
120074B-a_44	Rounded		Medium	120074B-a_98	Subrounded		Medium
120074B-a_45	Subrounded	Euhedral	Large	120074B-a_99	Subrounded		Medium
120074B-a_46	Rounded		Medium	120074B-a_100	Subrounded		Medium
120074B-a_47	Rounded		Small	120074B-a_101	Rounded		Medium
120074B-a_48	Rounded		Small	120074B-a_102	Subrounded		Medium
120074B-a_49	Rounded		Medium	120074B-a_103	Subrounded		Medium
120074B-a_50	Subrounded		Medium	120074B-a_104	Rounded		Medium
120074B-a_51	Subrounded	Euhedral	Medium	120074B-a_105	Subrounded		Medium
120074B-a_52	Rounded	Euhedral	Medium	120074B-a_106	Subrounded	Euhedral	Large
120074B-a_53	Rounded		Medium				

Appendix 2(5) Morphology of the zircon grains.

Sample ID	Description	Euhedral or not	Size	Sample ID	Description	Euhedral or not	Size
120097-120094A_01	Subrounded	Euhedral	Medium	120097-120094A_54	Subrounded	Euhedral	Medium
120097-120094A_02	Rounded		Medium	120097-120094A_55	Subrounded	Euhedral	Medium
120097-120094A_03	Rounded		Medium	120097-120094A_56	Rounded		Small
120097-120094A_04	Subrounded		Medium	120097-120094A_57	Rounded	Euhedral	Medium
120097-120094A_05	Subrounded		Medium	120097-120094A_58	Rounded	Euhedral	Small
120097-120094A_06	Subrounded		Small	120097-120094A_59	Subrounded		Medium
120097-120094A_07	Subrounded		Medium	120097-120094A_60	Subrounded		Small
120097-120094A_08	Subrounded	Euhedral	Medium	120097-120094A_61	Subrounded		Medium
120097-120094A_09	Subrounded	Euhedral	Medium	120097-120094A_62	Rounded	Euhedral	Medium
120097-120094A_10	Rounded		Medium	120097-120094A_63	Subrounded	Euhedral	Medium
120097-120094A_11	Subrounded	Euhedral	Medium	120097-120094A_64	Subrounded		Small
120097-120094A_12	Rounded	Euhedral	Medium	120097-120094A_65	Rounded		Medium
120097-120094A_13a	Subrounded		Large	120097-120094A_66	Rounded		Medium
120097-120094A_13b	Rim		Large	120097-120094A_67	Rounded		Small
120097-120094A_14	Subrounded		Medium	120097-120094A_68	Rounded		Large
120097-120094A_15	Subrounded	Euhedral	Medium	120097-120094A_69	Subrounded		Medium
120097-120094A_16	Rounded		Small	120097-120094A_70	Subrounded		Medium
120097-120094A_17	Rounded		Medium	120097-120094A_71	Rounded		Small
120097-120094A_18	Rounded		Small	120097-120094A_72	Subrounded	Euhedral	Large
120097-120094A_19	Rounded		Medium	120097-120094A_73	Subrounded		Medium
120097-120094A_20	Angular	Euhedral	Medium	120097-120094A_74	Angular		Small
120097-120094A_21	Subrounded		Large	120097-120094A_75	Subrounded		Medium
120097-120094A_22	Rounded		Small	120097-120094A_76	Subrounded		Small
120097-120094A_23	Subrounded	Euhedral	Medium	120097-120094A_77	Subrounded		Medium
120097-120094A_24	Subrounded		Small	120097-120094A_78	Subrounded		Medium
120097-120094A_25	Rounded		Small	120097-120094A_79	Rounded		Medium
120097-120094A_26	Rounded	Euhedral	Large	120097-120094A_80	Subrounded		Medium
120097-120094A_27	Rounded		Small	120097-120094A_81	Subrounded		Small
120097-120094A_28	Subrounded	Euhedral	Medium	120097-120094A_82	Rounded	Euhedral	Medium
120097-120094A_29	Subrounded	Euhedral	Large	120097-120094A_83	Rounded		Medium
120097-120094A_30	Subrounded	Euhedral	Medium	120097-120094A_84	Subrounded	Euhedral	Medium
120097-120094A_31	Rounded		Medium	120097-120094A_85	Rounded		Medium
120097-120094A_32	Rounded		Large	120097-120094A_86	Rounded		Medium
120097-120094A_33	Subrounded		Medium	120097-120094A_87	Subrounded		Medium
120097-120094A_34	Subrounded		Large	120097-120094A_88	Rounded		Medium
120097-120094A_35	Rounded	Euhedral	Medium	120097-120094A_89	Subrounded		Medium
120097-120094A_36	Rounded		Medium	120097-120094A_90	Rounded		Medium
120097-120094A_37	Subrounded		Medium	120097-120094A_91	Subrounded		Medium
120097-120094A_38	Rounded		Small	120097-120094A_92	Subrounded	Euhedral	Small
120097-120094A_39	Subrounded		Medium	120097-120094A_93	Subrounded		Medium
120097-120094A_40	Subrounded		Medium	120097-120094A_94	Rounded		Medium
120097-120094A_41	Rounded	Euhedral	Large	120097-120094A_95	Rounded		Medium
120097-120094A_42	Rounded	Euhedral	Medium	120097-120094A_96	Subrounded		Small
120097-120094A_43	Rounded		Medium	120097-120094A_97	Rounded		Small
120097-120094A_44	Subrounded	Euhedral	Large	120097-120094A_98	Rounded		Medium
120097-120094A_45	Rounded	Euhedral	Medium	120097-120094A_99	Rounded		Small
120097-120094A_46	Subrounded		Medium	120097-120094A_100	Subrounded		Small
120097-120094A_47	Rounded		Small	120097-120094A_101	Subrounded		Small
120097-120094A_48	Subrounded		Small	120097-120094A_102	Angular		Medium
120097-120094A_49	Rounded		Medium	120097-120094A_103	Rounded		Medium
120097-120094A_50	Rounded		Medium	120097-120094A_104	Subrounded		Small
120097-120094A_51	Subrounded	Euhedral	Medium	120097-120094A_105	Subrounded	Euhedral	Medium
120097-120094A_52	Subrounded		Small	120097-120094A_106	Subrounded		Large
120097-120094A_53	Subrounded	Euhedral	Medium				

Appendix 2(6) Morphology of the zircon grains.

Sample ID	Description	Euhedral or not	Size	Sample ID	Description	Euhedral or not	Size
120098A_01	Subrounded		Medium	120098A_54	Subrounded		Large
120098A_02	Angular		Small	120098A_55	Rounded		Medium
120098A_03	Rounded		Large	120098A_56	Rounded		Small
120098A_04	Subrounded		Medium	120098A_57	Rounded		Medium
120098A_05	Rounded		Small	120098A_58	Rounded	Euhedral	Medium
120098A_06	Subrounded		Small	120098A_59	Subrounded		Small
120098A_07	Subrounded	Euhedral	Medium	120098A_60	Rounded		Small
120098A_08	Rounded		Small	120098A_61	Rounded		Small
120098A_09	Rounded		Small	120098A_62	Subrounded	Euhedral	Medium
120098A_10	Rounded		Large	120098A_63	Rounded		Medium
120098A_11	Subrounded	Euhedral	Small	120098A_64	Subrounded	Euhedral	Small
120098A_12	Subrounded		Small	120098A_65	Subrounded		Medium
120098A_13	Subrounded		Small	120098A_66	Subrounded		Medium
120098A_14	Subrounded		Medium	120098A_67	Subrounded		Medium
120098A_15	Rounded		Large	120098A_68	Rounded		Medium
120098A_16	Rounded		Medium	120098A_69	Rounded		Medium
120098A_17	Subrounded	Euhedral	Medium	120098A_70	Angular		Medium
120098A_18	Angular		Small	120098A_71	Rounded		Medium
120098A_19	Rounded		Small	120098A_72	Subrounded	Euhedral	Medium
120098A_20	Rounded		Small	120098A_73	Subrounded		Medium
120098A_21	Angular	Euhedral	Medium	120098A_74	Subrounded		Medium
120098A_22	Angular		Medium	120098A_75	Subrounded	Euhedral	Medium
120098A_23	Rounded		Small	120098A_76	Subrounded		Medium
120098A_24	Subrounded		Medium	120098A_77	Rounded	Euhedral	Medium
120098A_25	Subrounded		Medium	120098A_78	Rounded		Small
120098A_26	Subrounded		Medium	120098A_79	Subrounded		Small
120098A_27	Subrounded		Medium	120098A_80	Subrounded	Euhedral	Large
120098A_28	Subrounded		Medium	120098A_81	Subrounded		Medium
120098A_29a	Subrounded		Medium	120098A_82	Rounded		Medium
120098A_29b	Rim		Medium	120098A_83	Rounded		Medium
120098A_30	Rounded		Medium	120098A_84	Rounded		Medium
120098A_31	Subrounded		Medium	120098A_85	Rounded		Small
120098A_32	Subrounded		Medium	120098A_86	Subrounded	Euhedral	Large
120098A_33	Subrounded		Medium	120098A_87	Rounded		Small
120098A_34	Subrounded		Small	120098A_88	Rounded		Small
120098A_35	Subrounded		Small	120098A_89	Rounded		Small
120098A_36	Rounded	Euhedral	Large	120098A_90	Subrounded		Small
120098A_37	Subrounded		Medium	120098A_91	Rounded		Medium
120098A_38	Subrounded		Small	120098A_92	Rounded	Euhedral	Large
120098A_39	Rounded		Medium	120098A_93	Subrounded	Euhedral	Medium
120098A_40	Subrounded		Small	120098A_94	Subrounded		Medium
120098A_41	Subrounded		Large	120098A_95	Rounded		Medium
120098A_42a	Rounded		Medium	120098A_96	Subrounded		Medium
120098A_42b	Rim		Medium	120098A_97	Rounded	Euhedral	Medium
120098A_43	Angular		Small	120098A_98	Subrounded		Small
120098A_44	Rounded		Small	120098A_99	Subrounded		Small
120098A_45	Subrounded		Small	120098A_100	Subrounded		Small
120098A_46	Subrounded		Small	120098A_101	Subrounded	Euhedral	Medium
120098A_47	Rounded		Small	120098A_102	Subrounded		Medium
120098A_48	Subrounded		Medium	120098A_103	Rounded		Medium
120098A_49	Subrounded		Medium	120098A_104	Rounded		Medium
120098A_50	Angular	Euhedral	Medium	120098A_105	Subrounded	Euhedral	Medium
120098A_51	Subrounded		Small	120098A_106	Rounded		Medium
120098A_52	Subrounded		Medium	120098A_107	Subrounded		Small
120098A_53	Subrounded		Large				

Appendix 2(7) Morphology of the zircon grains.

Sample ID	Description	Euhedral or not	Size	Sample ID	Description	Euhedral or not	Size
120100A_01	Subrounded		Medium	120100A_56	Subrounded		Medium
120100A_02	Rounded		Medium	120100A_57	Subrounded		Medium
120100A_03	Rounded		Medium	120100A_58	Subrounded		Medium
120100A_04	Subrounded		Small	120100A_59	Subrounded		Medium
120100A_05	Subrounded		Large	120100A_60	Subrounded	Euhedral	Medium
120100A_06	Subrounded	Euhedral	Medium	120100A_61	Subrounded	Euhedral	Medium
120100A_07	Rounded		Small	120100A_62	Rounded		Medium
120100A_08	Subrounded		Large	120100A_63	Subrounded		Small
120100A_09	Angular		Small	120100A_64	Subrounded	Euhedral	Medium
120100A_10a	Rounded		Large	120100A_65	Subrounded	Euhedral	Medium
120100A_10b	Rim		Large	120100A_66	Rounded		Small
120100A_11	Subrounded		Small	120100A_67	Subrounded	Euhedral	Medium
120100A_12	Subrounded	Euhedral	Medium	120100A_68	Subrounded	Euhedral	Medium
120100A_13	Subrounded	Euhedral	Medium	120100A_69	Angular	Euhedral	Medium
120100A_14	Subrounded	Euhedral	Small	120100A_70	Subrounded		Small
120100A_15	Subrounded		Medium	120100A_71	Subrounded		Small
120100A_16	Rounded		Large	120100A_72	Subrounded		Medium
120100A_17	Subrounded		Medium	120100A_73	Rounded		Medium
120100A_18	Subrounded		Medium	120100A_74	Subrounded		Medium
120100A_19	Rounded		Small	120100A_75	Rounded		Large
120100A_20	Rounded		Medium	120100A_76	Rounded		Medium
120100A_21	Rounded		Medium	120100A_77	Subrounded		Medium
120100A_22a	Rounded		Medium	120100A_78	Subrounded	Euhedral	Small
120100A_22b	Rim		Medium	120100A_79	Subrounded	Euhedral	Medium
120100A_23	Subrounded		Medium	120100A_80	Rounded		Small
120100A_24	Angular	Euhedral	Large	120100A_81	Subrounded		Large
120100A_25	Subrounded		Medium	120100A_82	Subrounded		Medium
120100A_26	Subrounded	Euhedral	Medium	120100A_83	Subrounded		Medium
120100A_27	Subrounded		Small	120100A_84	Subrounded		Medium
120100A_28	Subrounded	Euhedral	Medium	120100A_85	Rounded		Small
120100A_29	Subrounded		Small	120100A_86a	Subrounded	Euhedral	Medium
120100A_30	Subrounded	Euhedral	Medium	120100A_86b	Rim		Medium
120100A_31	Rounded		Small	120100A_87	Subrounded		Medium
120100A_32	Rounded		Small	120100A_88	Subrounded		Medium
120100A_33	Rounded		Small	120100A_89	Rounded		Small
120100A_34	Subrounded		Medium	120100A_90	Subrounded		Medium
120100A_35	Subrounded		Medium	120100A_91	Subrounded		Large
120100A_36	Subrounded	Euhedral	Medium	120100A_92	Subrounded		Medium
120100A_37	Subrounded		Large	120100A_93	Rounded		Medium
120100A_38	Rounded		Small	120100A_94	Rounded		Medium
120100A_39	Angular		Small	120100A_95	Subrounded		Small
120100A_40	Subrounded		Medium	120100A_96	Rounded		Medium
120100A_41	Subrounded	Euhedral	Medium	120100A_97	Subrounded	Euhedral	Medium
120100A_42	Subrounded		Medium	120100A_98	Rounded		Small
120100A_43	Rounded	Euhedral	Medium	120100A_99	Subrounded		Medium
120100A_44	Subrounded		Medium	120100A_100	Subrounded		Medium
120100A_45	Subrounded		Medium	120100A_101	Subrounded	Euhedral	Medium
120100A_46	Subrounded		Medium	120100A_102	Subrounded		Small
120100A_47	Subrounded		Medium	120100A_103	Subrounded		Medium
120100A_48	Rounded		Medium	120100A_104	Subrounded	Euhedral	Medium
120100A_49	Subrounded	Euhedral	Large	120100A_105	Subrounded		Small
120100A_50	Rounded	Euhedral	Medium	120100A_106	Rounded	Euhedral	Medium
120100A_51	Subrounded		Medium	120100A_107	Rounded		Small
120100A_52	Subrounded		Small	120100A_108	Subrounded		Small
120100A_53	Subrounded		Large	120100A_109	Subrounded	Euhedral	Medium
120100A_54	Subrounded	Euhedral	Medium	120100A_110	Rounded		Medium
120100A_55	Subrounded		Medium				

Appendix 2(8) Morphology of the zircon grains.

Sample ID	Description	Euhedral or not	Size	Sample ID	Description	Euhedral or not	Size
120112B_01	Rounded		Small	120112B_52	Rounded		Medium
120112B_02	Subrounded		Medium	120112B_53	Subrounded	Euhedral	Medium
120112B_03	Subrounded		Small	120112B_54	Rounded		Medium
120112B_04	Subrounded		Small	120112B_55	Subrounded		Medium
120112B_05	Subrounded		Large	120112B_56	Subrounded		Medium
120112B_06	Subrounded		Medium	120112B_57	Rounded		Medium
120112B_07	Subrounded		Medium	120112B_58	Rounded		Small
120112B_08	Rounded		Small	120112B_59	Subrounded	Euhedral	Medium
120112B_09	Angular		Small	120112B_60	Subrounded		Small
120112B_10	Angular		Medium	120112B_61	Rounded	Euhedral	Medium
120112B_11	Angular		Small	120112B_62	Rounded		Medium
120112B_12	Subrounded		Large	120112B_63	Subrounded	Euhedral	Medium
120112B_13	Subrounded		Medium	120112B_64	Subrounded	Euhedral	Medium
120112B_14	Angular		Small	120112B_65	Rounded		Small
120112B_15	Subrounded		Medium	120112B_66	Subrounded		Medium
120112B_16	Rounded		Large	120112B_67	Subrounded		Medium
120112B_17	Subrounded		Medium	120112B_68	Rounded		Medium
120112B_18	Subrounded		Medium	120112B_69	Subrounded		Medium
120112B_19	Subrounded		Medium	120112B_70	Subrounded		Medium
120112B_20	Rounded		Medium	120112B_71	Subrounded		Small
120112B_21	Subrounded		Medium	120112B_72	Subrounded		Medium
120112B_22	Subrounded		Medium	120112B_73	Subrounded	Euhedral	Medium
120112B_23	Subrounded	Euhedral	Small	120112B_74	Subrounded		Medium
120112B_24	Subrounded	Euhedral	Small	120112B_75	Subrounded		Medium
120112B_25	Subrounded		Medium	120112B_76	Subrounded	Euhedral	Medium
120112B_26	Subrounded		Medium	120112B_77	Angular		Medium
120112B_27	Subrounded	Euhedral	Medium	120112B_78	Subrounded		Medium
120112B_28	Subrounded		Medium	120112B_79	Rounded		Medium
120112B_29	Subrounded		Small	120112B_80	Subrounded		Medium
120112B_30	Subrounded		Medium	120112B_81	Angular		Large
120112B_31	Subrounded	Euhedral	Medium	120112B_82	Rounded		Medium
120112B_32	Rounded		Small	120112B_83	Subrounded		Small
120112B_33	Rounded		Small	120112B_84	Rounded		Medium
120112B_34	Subrounded		Medium	120112B_85	Rounded		Small
120112B_35	Subrounded		Medium	120112B_86	Rounded		Small
120112B_36	Angular		Medium	120112B_87	Subrounded		Medium
120112B_37	Subrounded		Medium	120112B_88	Subrounded		Medium
120112B_38	Subrounded		Large	120112B_89	Rounded	Euhedral	Medium
120112B_39	Subrounded		Large	120112B_90	Subrounded		Medium
120112B_40	Rounded		Medium	120112B_91	Angular		Small
120112B_41	Angular		Medium	120112B_92	Rounded		Small
120112B_42	Rounded		Medium	120112B_93	Subrounded		Medium
120112B_43	Subrounded	Euhedral	Small	120112B_94	Subrounded		Small
120112B_44	Subrounded		Medium	120112B_95	Rounded		Small
120112B_45	Subrounded		Medium	120112B_96	Subrounded	Euhedral	Medium
120112B_46	Rounded		Medium	120112B_97	Rounded		Large
120112B_47	Subrounded		Medium	120112B_98	Subrounded		Small
120112B_48	Rounded		Medium	120112B_99	Angular		Small
120112B_49	Rounded		Medium	120112B_100	Subrounded		Medium
120112B_50	Subrounded	Euhedral	Medium	120112B_101	Subrounded		Medium
120112B_51	Subrounded	Euhedral	Large				

Appendix 2(9) Morphology of the zircon grains.

Sample ID	Description	Euhedral or not	Size	Sample ID	Description	Euhedral or not	Size
120112C_01	Angular		Medium	120112C_52	Rounded		Medium
120112C_02	Rounded		Medium	120112C_53	Subrounded		Small
120112C_03	Subrounded		Medium	120112C_54	Subrounded		Medium
120112C_04	Subrounded	Euhedral	Small	120112C_55	Rounded	Euhedral	Large
120112C_05	Rounded		Medium	120112C_56	Rounded		Small
120112C_06a	Rounded	Euhedral	Large	120112C_57	Subrounded		Medium
120112C_06b	Rim		Large	120112C_58	Subrounded		Medium
120112C_07	Rounded		Medium	120112C_59	Subrounded	Euhedral	Medium
120112C_08	Subrounded	Euhedral	Small	120112C_60	Rounded		Small
120112C_09	Rounded		Medium	120112C_61	Angular		Medium
120112C_10	Subrounded	Euhedral	Small	120112C_62	Rounded		Small
120112C_11	Subrounded		Medium	120112C_63	Subrounded		Large
120112C_12	Subrounded		Medium	120112C_64	Rounded		Small
120112C_13a	Subrounded	Euhedral	Medium	120112C_65	Subrounded		Medium
120112C_13b	Rim		Medium	120112C_66a	Subrounded	Euhedral	Large
120112C_14	Subrounded	Euhedral	Medium	120112C_66b	Rim		Large
120112C_15	Subrounded		Medium	120112C_67	Subrounded		Medium
120112C_16	Subrounded		Medium	120112C_68	Rounded		Medium
120112C_17	Rounded		Large	120112C_69	Subrounded	Euhedral	Medium
120112C_18	Subrounded		Small	120112C_70	Rounded		Large
120112C_19	Subrounded		Small	120112C_71	Subrounded	Euhedral	Medium
120112C_20	Subrounded	Euhedral	Large	120112C_72	Subrounded	Euhedral	Medium
120112C_21	Subrounded	Euhedral	Medium	120112C_73	Subrounded	Euhedral	Medium
120112C_22	Subrounded		Medium	120112C_74	Subrounded		Medium
120112C_23	Subrounded		Medium	120112C_75	Subrounded	Euhedral	Medium
120112C_24	Subrounded		Medium	120112C_76	Subrounded		Small
120112C_25	Subrounded		Medium	120112C_77	Subrounded		Medium
120112C_26	Subrounded		Medium	120112C_78	Subrounded		Small
120112C_27	Angular		Small	120112C_79	Rounded		Medium
120112C_28	Subrounded		Small	120112C_80	Subrounded		Large
120112C_29	Rounded		Medium	120112C_81	Angular	Euhedral	Small
120112C_30	Rounded		Medium	120112C_82	Subrounded		Medium
120112C_31	Rounded		Medium	120112C_83	Rounded		Medium
120112C_32	Angular	Euhedral	Small	120112C_84	Subrounded		Small
120112C_33	Rounded		Small	120112C_85	Subrounded		Small
120112C_34	Subrounded		Medium	120112C_86	Subrounded		Medium
120112C_35	Subrounded		Medium	120112C_87	Subrounded		Medium
120112C_36	Subrounded	Euhedral	Medium	120112C_88	Rounded		Small
120112C_37	Subrounded	Euhedral	Medium	120112C_89	Subrounded	Euhedral	Large
120112C_38	Rounded		Small	120112C_90	Rounded	Euhedral	Medium
120112C_39	Rounded		Small	120112C_91	Subrounded		Medium
120112C_40	Subrounded		Small	120112C_92	Rounded		Small
120112C_41	Rounded		Medium	120112C_93	Subrounded		Small
120112C_42	Rounded		Small	120112C_94	Subrounded		Small
120112C_43	Subrounded		Small	120112C_95	Subrounded	Euhedral	Medium
120112C_44	Subrounded		Small	120112C_96	Rounded		Medium
120112C_45	Subrounded	Euhedral	Small	120112C_97	Angular		Medium
120112C_46	Rounded		Medium	120112C_98	Subrounded	Euhedral	Large
120112C_47	Angular	Euhedral	Medium	120112C_99	Subrounded	Euhedral	Large
120112C_48	Subrounded	Euhedral	Medium	120112C_100	Rounded		Medium
120112C_49	Rounded	Euhedral	Medium				
120112C_50	Rounded		Medium				
120112C_51	Rounded		Medium				

Appendix 3(1) U-Pb analyses. Green color mean that the point is out from 90-110% corcondant. Other colors are explained on comments.

				Pb	Th	U									Derived ages and errors						T-W (Pbc corrected)			
Sample	Comment	Pb206/Pb204	206Pbc(%)	ppm			207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	r	% Concordance	207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	238U/206Pb	1s %	207Pb/206Pb	1s %
120059A_01	0	465955	0,0037	85	63	193	0,1249	0,0012	6,570	0,145	0,382	0,008	0,90	103	2027	17	2055	19	2084	36	2,620253533	2,04	0,12485143	0,98
120059A_02	0	487541	0,0035	87	51	226	0,1222	0,0010	5,733	0,122	0,340	0,007	0,93	95	1988	14	1936	18	1889	33	2,937654329	2,02	0,12215025	0,81
120059A_03	0	190851	0,0090	38	63	83	0,1234	0,0013	6,161	0,137	0,362	0,007	0,88	99	2006	19	1999	19	1992	35	2,761070279	2,04	0,1233789	1,05
120059A_04	0	271736	0,0063	55	94	133	0,1244	0,0012	5,529	0,121	0,322	0,007	0,90	89	2021	17	1905	19	1801	32	3,103305335	2,03	0,12444183	0,95
120059A_05	0	925084	0,0019	181	220	377	0,1320	0,0011	7,066	0,152	0,388	0,008	0,92	100	2124	15	2120	19	2115	36	2,57484393	2,03	0,13195022	0,86
120059A_06	0	304786	0,0056	57	47	113	0,1353	0,0014	7,941	0,176	0,426	0,009	0,89	105	2168	18	2224	20	2286	39	2,349327809	2,05	0,13531298	1,02
120059A_07	0	162185	0,0106	34	55	60	0,1475	0,0017	8,723	0,198	0,429	0,009	0,87	99	2318	19	2309	20	2300	40	2,332063922	2,06	0,14753532	1,14
120059A_08	0	167001	0,0103	33	38	68	0,1281	0,0016	6,890	0,160	0,390	0,008	0,84	102	2073	22	2097	20	2123	37	2,564525935	2,07	0,12814829	1,25
120059A_09	0	344583	0,0050	67	93	152	0,1224	0,0012	6,047	0,133	0,358	0,007	0,89	99	1991	17	1983	19	1974	35	2,790851305	2,04	0,12239502	0,99
120059A_10	0	431248	0,0040	79	58	182	0,1232	0,0012	6,357	0,140	0,374	0,008	0,89	102	2003	17	2026	19	2050	36	2,671779114	2,04	0,12318586	0,99
120059A_11	0	345599	0,0050	61	25	145	0,1268	0,0011	6,591	0,143	0,377	0,008	0,91	100	2054	16	2058	19	2062	36	2,653038476	2,03	0,12682616	0,90
120059A_12	0	264249	0,0065	59	146	114	0,1248	0,0012	6,287	0,138	0,365	0,007	0,90	99	2025	17	2017	19	2008	35	2,736146358	2,03	0,124757	0,96
120059A_13	0	170487	0,0101	34	21	48	0,2004	0,0020	15,621	0,343	0,565	0,012	0,90	102	2829	16	2854	21	2889	48	1,768813912	2,05	0,20039659	0,98
120059A_14	0	403379	0,0043	78	42	121	0,1890	0,0017	13,738	0,297	0,527	0,011	0,91	100	2734	14	2732	20	2729	45	1,89699769	2,04	0,18901484	0,88
120059A_15	0	437040	0,0039	92	172	186	0,1257	0,0011	6,441	0,139	0,372	0,008	0,92	100	2038	15	2038	19	2038	35	2,68986607	2,03	0,12566036	0,86
120059A_16	0	319781	0,0054	68	69	118	0,2047	0,0021	12,110	0,267	0,429	0,009	0,89	80	2864	16	2613	20	2302	40	2,330425194	2,05	0,2046841	1,00
120059A_17	0	403741	0,0043	77	141	210	0,1159	0,0011	4,852	0,106	0,304	0,006	0,90	90	1894	17	1794	18	1709	30	3,293394059	2,03	0,11590184	0,97
120059A_18	0	532978	0,0032	101	105	219	0,1281	0,0012	6,794	0,148	0,385	0,008	0,90	101	2072	16	2085	19	2098	36	2,600256535	2,03	0,1281245	0,94
120059A_19	0	1213	1,4186	32	44	68	0,1174	0,0013	5,982	0,135	0,369	0,008	0,87	106	1918	20	1973	19	2027	36	2,706578269	2,05	0,11743324	1,12
120059A_20	0	178189	0,0097	34	22	57	0,1643	0,0018	11,147	0,252	0,492	0,010	0,87	103	2500	19	2536	21	2580	44	2,031695447	2,06	0,16425949	1,12
120059A_21	0	198293	0,0087	39	22	145	0,2011	0,0022	6,006	0,134	0,217	0,004	0,87	45	2835	18	1977	19	1264	24	4,615804798	2,06	0,20105507	1,09
120059A_22	0	632621	0,0027	111	40	269	0,1254	0,0011	6,441	0,140	0,373	0,008	0,91	100	2034	16	2038	19	2041	35	2,684327288	2,03	0,12540109	0,91
120059A_23	inclusions	13262	0,1298	289	403	779	0,1237	0,0010	5,135	0,109	0,301	0,006	0,93	84	2010	14	1842	18	1696	30	3,32176933	2,02	0,12370214	0,78
120059A_24	0	411636	0,0042	81	113	179	0,1227	0,0013	6,160	0,138	0,364	0,007	0,88	100	1996	19	1999	19	2001	35	2,747231631	2,05	0,12273475	1,08
120059A_25	0	432048	0,0040	83	43	130	0,1887	0,0016	13,637	0,292	0,524	0,011	0,92	99	2731	13	2725	20	2717	45	1,908026103	2,03	0,18871078	0,82
120059A_26	0	104677	0,0164	23	25	29	0,2089	0,0028	16,317	0,386	0,567	0,012	0,83	100	2897	22	2896	22	2894	49	1,764856019	2,12	0,20885776	1,34
120059A_27	0	53805	0,0320	11	23	91	0,1011	0,0019	1,301	0,035	0,093	0,002	0,72	35	1644	34	846	15	575	12	10,71353071	2,11	0,10108919	1,87
120059A_28	0	6980	0,2466	184	337	388	0,1257	0,0010	6,491	0,139	0,374	0,008	0,92	101	2039	14	2045	19	2050	35	2,670622007	2,02	0,12572098	0,82
120059A_29	0	888663	0,0019	181	235	353	0,1330	0,0013	7,302	0,161	0,398	0,008	0,89	101	2137	17	2149	19	2161	37	2,510536766	2,04	0,13296048	0,99
120059A_30	inclusions	1134986	0,0015	204	130	481	0,1173	0,0009	6,030	0,128	0,373	0,008	0,93	107	1915	14	1980	18	2043	35	2,681706088	2,02	0,11728606	0,79
120059A_31	0	815164	0,0021	204	595	317	0,1349	0,0011	7,563	0,161	0,407	0,008	0,93	102	2163	14	2181	19	2200	38	2,459099117	2,02	0,13489012	0,79
120059A_32	0	684063	0,0025	127	114	289	0,1235	0,0010	6,374	0,136	0,374	0,008	0,92	102	2007	14	2029	19	2050	35	2,670365739	2,02	0,12345439	0,81
120059A_33	inclusions	4858	0,3544	72	273	1182	0,0838	0,0009	0,629	0,014	0,054	0,001	0,88	26	1289	21	495	9	342	7	18,37810656	2,03	0,08384419	1,06
120059A_34	0	212413	0,0081	39	22	82	0,1395	0,0015	7,913	0,177	0,411	0,008	0,88	100	2221	18	2221	20	2222	38	2,43043079	2,05	0,13948536	1,07
120059A_35	0	12863	0,1338	303	305	481	0,1712	0,0013	11,756	0,250	0,498	0,010	0,93	101	2569	13	2585	20	2606	43	2,007589911	2,02	0,17117637	0,78
120059A_36	0	1096082	0,0016	289	817	379	0,1576	0,0012	9,935	0,211	0,457	0,009	0,93	100	2430	13	2429	19	2427	41	2,186895991	2,02	0,15758244	0,78
120059A_37	0	448522	0,0038	85	87	185	0,1238	0,0013	6,537	0,145	0,383	0,008	0,89	104	2011	18	2051	19	2091	36	2,610444502	2,04	0,12375706	1,02
120059A_38	0	424038	0,0041	86	104	143	0,1627	0,0014	10,534	0,227	0,470	0,010	0,92	100	2484	14	2483	20	2481	42	2,129841162	2,03	0,16271441	0,86
120059A_39	0	4511	0,3816	71	36	102	0,1959	0,0017	15,454	0,334	0,572	0,012	0,91	104	2793	14	2844	20	2916	48	1,748070961	2,04	0,19593223	0,89
120059A_40	0	227722	0,0076	46	41	62	0,2033	0,0025	16,186	0,376	0,577	0,012	0,84	103	2853	20	2888	22	2938	49	1,732090884	2,10	0,20333886	1,25
120059A_41	0	250950	0,0069	50	77	107	0,1230	0,0015	6,266	0,144	0,369	0,008	0,85	101	2000	21	2014	20	2027	36	2,706627446	2,06	0,12299966	1,20
120059A_42	short	1081579	0,0016	214	271	464	0,1271	0,0013	6,459	0,144	0,369	0,008	0,88	98	2058	18	2040	19	2023	35	2,713093596	2,04	0,12710206	1,04
120059A_43	0	149069	0,0115	32	61	63	0,1265	0,0017	6,481	0,153	0,372	0,008	0,83	99	2049	23	2043	21	2037	36	2,690377534	2,07	0,12645501	1,32
120059A_44	0	160677	0,0107	34	40	48	0,1886	0,0022	13,831	0,314	0,532	0,011	0,86	101	2730	19	2738	21	2749	46	1,880578089	2,07	0,18864757	1,15
120059A_45	0	363300	0,0047	67	57	154	0,1249	0,0012	6,419	0,141	0,373	0,008	0,90	101	2027	17	2035	19	2042	35	2,682758182	2,03	0,12489182	0,97
120059A_46	0	392933	0,0044	82	144	159	0,1305	0,0014	7,027	0,157	0,390	0,008	0,88	101	2105	19	2115	20	2125	37	2,561319631	2,05	0,13053159	1,08
120059A_47	0	3155	0,5456	63	128	132	0,1204	0,0012	5,987	0,132	0,361	0,007	0,90	101	1962	17	1974	19	1985	35	2,772939182	2,03	0,12041306	0,98
120059A_48	0	23278	0,0740	5	9	8	0,1702	0,0039	11,142	0,327	0,475	0,011	0,65	98	2559	38	2535	27	2505	48	2,105806452	2,31	0,17017459	2,28
120059A_49	0	15774	0,1091	287	42	462	0,1864	0,0016	13,872	0,298	0,540	0,011	0,92	103	2711	14	2741	20	2782	46	1,852929446	2,03	0,18641726	0,84
120059A_50	0	701192	0,0025	136	145	294	0,1247	0,0012	6,498	0,142	0,378	0,008	0,90	102	2025	17	2046	19	2066	36	2,646202089	2,03	0,12470904	0,95
120059A_51	0	690685	0,0025	124	66	293	0,1265	0,0011	6,509	0,141	0,373	0,008	0,91	100	2050	16	2047	19	2044	35	2,679639877	2,03	0,12650242	0,91
120059A_52	0	468402	0,0037	99	94	132	0,2092	0,0017	16,245	0,348	0,563	0,011	0,92	99	2899	13	2891	20	2880	47	1,775377813	2,03	0,20916855	0,83
120059A_53	0	208511	0,0083	54	158	76	0,1478	0,0016	8,800	0,197	0,432	0,009	0,88	100	2321	18	2318	20	2314	40	2,316084732	2,05	0,14782539	1,07
120059A_54	0	213842	0,0081	40	37	91	0,1257	0,0014	6,457	0,146	0,373	0,008	0,87	100	2038	20	2040	20	2042	36	2,683062358	2,05	0,12565357	1,13
120059A_55	0	3587	0,4798	61	54	144	0,1203	0,0012	6,055	0,133	0,365	0,007	0,90	102	1960	17	1984	19	2007	35	2,738297978	2,03	0,12025977	0,96
120059A_56		682830	0,0025	142	252	281	0,1273	0,0013	6,746	0,150	0,384	0,008	0,88	102	2060	18	2079	20	2097	36	2,601071968	2,04	0,12725455	1,04
120059A_57	0	471512	0,0037	96	67	130	0,2148	0,0019	17,058	0,369	0,576	0,012	0,91	100	2942	14	2938	21	2932	48	1,736607674	2,03	0,21484932	0,88
120059A_58	0	190473	0,0090	40	41	57	0,1881	0,0019	13,613	0,302	0,525	0,011	0,89	100	2726	17	2723	21	2719	45	1,905662805	2,05	0,18814257	1,02
120059A_59	0	326951	0,0053	72	99	118	0,1819	0,0018	10,995	0,241	0,438	0,009	0,90	88	2670	16	2523	20	2343	40	2,281217675	2,04	0,1819175	0,96
120059A_60	0	269304	0,0064	55	97	120	0,1228	0,0013	6,017	0,134	0,355	0,007	0,88	98	1997	18	1978	19	1961	34	2,813081798	2,04	0,12275129	1,04
120059A_61	0	388047	0,0044	71	66	165	0,1250	0,0012	6,408	0,140	0,372	0,008	0,90	100	2029	17	2033	19	2038	35	2,689676801	2,03	0,12499457	0,95
120059A_62	0	704100	0,0024	121	79	309	0,1226	0,0012	6,097	0,133	0,361	0,007	0,90	100	1994	17	1990	19	1986	35	2,771873872	2,03	0,12256761	0,95
120059A_63	0	524088	0,0033	100	102	285	0,1233	0,0012	4,947	0,109	0,291	0,006	0,90	82	2005	17	1810	18	1646	29	3,437502957	2,03	0,12332185	0,97
120059A_64	0	307167	0,0056	56	48	131	0,1214	0,0014	6,198	0,141	0,370	0,008	0,87	103	1977	20	2004	20	2031	36	2,700896384	2,05	0,12141414	1,14
120059A_65	0	1044595	0,0016	224	401	432	0,1276	0,0012	6,728	0,146	0,382	0,008	0,91	101	2066	16	2076	19	2087	36	2,615530254	2,03	0,12762399	0,92
120059A_66	0	121808	0,0141	23	21	52	0,1241	0,0018	6,288	0,153	0,368	0,008	0,80	100	2016	26	2017	21	2018	36	2,72063689	2,09	0,12406812	1,47

Appendix 3(2) U-Pb analyses.

120059A_67	0	6756	0,2548	104	17	262	0,1205	0,0011	6,080	0,133	0,366	0,007	0,90	102	1963	17	1987	19	2011	35	2,732300562	2,03	0,12048575	0,94
120059A_68	0	117956	0,0146	27	44	36	0,1884	0,0022	13,618	0,312	0,524	0,011	0,86	100	2728	19	2724	21	2717	46	1,907502589	2,08	0,18839783	1,19
120059A_69	0	172453	0,0100	35	61	79	0,1172	0,0014	5,590	0,128	0,346	0,007	0,86	100	1914	21	1915	20	1915	34	2,891433961	2,05	0,11723465	1,18
120059A_70	0	575934	0,0030	117	74	165	0,2127	0,0019	16,210	0,352	0,553	0,011	0,91	97	2926	15	2889	21	2836	46	1,809448162	2,03	0,21273332	0,91
120059A_71	step in rat	3427	0,5024	207	44	451	0,1144	0,0015	6,519	0,153	0,413	0,009	0,84	119	1871	23	2049	20	2230	39	2,419793874	2,06	0,11441632	1,29
120059A_72	0	198325	0,0087	38	41	84	0,1261	0,0021	6,472	0,166	0,372	0,008	0,75	100	2045	30	2042	22	2040	37	2,686832858	2,13	0,12612091	1,70
120059A_73	inclusions	21397	0,0805	381	54	640	0,1615	0,0013	11,771	0,252	0,529	0,011	0,93	111	2471	14	2586	20	2736	45	1,89142445	2,02	0,16146989	0,81
120059A_74	0	463481	0,0037	87	56	168	0,1504	0,0014	9,074	0,198	0,438	0,009	0,91	100	2350	16	2345	20	2340	40	2,284624544	2,03	0,15035186	0,93
120059A_75	0	14418	0,1194	256	107	395	0,1960	0,0016	14,496	0,311	0,536	0,011	0,92	99	2793	14	2783	20	2768	45	1,864542086	2,02	0,19602424	0,83
120059A_76	0	329200	0,0052	66	95	145	0,1245	0,0014	6,151	0,139	0,358	0,007	0,87	98	2022	20	1998	20	1974	35	2,791738369	2,04	0,12454659	1,11
120059A_77	0	388041	0,0044	71	39	144	0,1458	0,0014	8,590	0,189	0,427	0,009	0,90	100	2298	17	2296	20	2293	39	2,341028629	2,03	0,14584965	0,98
120059A_78	0	295748	0,0058	61	55	89	0,1866	0,0020	13,606	0,304	0,529	0,011	0,88	101	2713	17	2723	21	2736	46	1,891445067	2,05	0,18664577	1,06
120059A_79	0	11452	0,1503	157	138	360	0,1194	0,0011	6,114	0,133	0,372	0,008	0,91	105	1947	16	1992	19	2037	35	2,691542552	2,02	0,11935636	0,91
120059A_80	0	134753	0,0128	26	30	58	0,1240	0,0016	6,266	0,147	0,366	0,008	0,83	100	2015	23	2014	20	2013	36	2,728681103	2,07	0,12401451	1,30
120059A_81	0	79424	0,0217	17	34	33	0,1282	0,0020	6,727	0,168	0,380	0,008	0,78	100	2074	28	2076	22	2078	37	2,628588872	2,11	0,12824113	1,59
120059A_82	0	1261137	0,0014	340	819	376	0,1935	0,0017	14,170	0,305	0,531	0,011	0,92	99	2772	14	2761	20	2746	45	1,882560399	2,02	0,19347005	0,86
120059A_83	0	456784	0,0038	94	80	126	0,2170	0,0020	17,150	0,373	0,573	0,012	0,91	99	2959	15	2943	21	2921	48	1,744592227	2,03	0,21700396	0,91
120059A_84	0	326358	0,0053	72	172	146	0,1246	0,0014	6,060	0,136	0,353	0,007	0,87	96	2024	19	1984	19	1947	34	2,835977201	2,04	0,12463835	1,10
120059A_85	0	1192878	0,0014	219	148	502	0,1296	0,0011	6,719	0,145	0,376	0,008	0,91	98	2093	15	2075	19	2057	35	2,659837533	2,02	0,12960893	0,88
120059A_86	0	1490953	0,0012	285	303	635	0,1228	0,0011	6,290	0,137	0,371	0,008	0,91	102	1998	16	2017	19	2036	35	2,692273693	2,02	0,12282528	0,91
120059A_87	0	2515	0,6844	80	633	705	0,0866	0,0010	1,072	0,024	0,090	0,002	0,87	41	1352	22	740	12	554	11	11,14525547	2,03	0,0866344	1,13
120059A_88	0	291513	0,0059	56	49	114	0,1273	0,0014	7,095	0,159	0,404	0,008	0,88	106	2061	19	2123	20	2189	38	2,473426806	2,04	0,1272693	1,09
120059A_89	0	371045	0,0046	71	87	167	0,1160	0,0013	5,638	0,127	0,353	0,007	0,87	103	1895	20	1922	19	1947	34	2,836294461	2,04	0,11597936	1,11
120059A_90	0	241985	0,0071	48	27	99	0,1973	0,0023	10,477	0,239	0,385	0,008	0,86	75	2804	19	2478	21	2101	37	2,595999311	2,07	0,19725303	1,17
120059A_91	0	578839	0,0030	114	74	170	0,1888	0,0018	14,035	0,307	0,539	0,011	0,90	102	2732	16	2752	21	2780	46	1,854499548	2,03	0,18877346	0,95
120059A_92	0	190203	0,0091	35	32	83	0,1236	0,0015	6,214	0,144	0,365	0,007	0,85	100	2008	22	2006	20	2005	35	2,741490345	2,06	0,12355085	1,23
120059A_93	0	627871	0,0027	118	130	262	0,1256	0,0013	6,566	0,146	0,379	0,008	0,89	102	2037	18	2055	19	2072	36	2,637285262	2,03	0,1255898	1,03
120059A_94	0	110910	0,0155	23	21	32	0,1972	0,0027	14,800	0,353	0,544	0,011	0,82	100	2803	22	2802	22	2802	48	1,836786455	2,11	0,19715552	1,38
120059A_95	inclusions	97068	0,0177	18	11	45	0,1229	0,0024	5,798	0,159	0,342	0,007	0,70	95	1998	35	1946	24	1898	36	2,92162133	2,17	0,12285256	1,99
120059A_96	0	421733	0,0041	86	143	183	0,1234	0,0013	6,199	0,138	0,364	0,007	0,88	100	2005	19	2004	19	2003	35	2,743563352	2,03	0,12335771	1,05
120059A_97	0	283191	0,0061	54	70	113	0,1263	0,0015	6,897	0,157	0,396	0,008	0,86	105	2047	20	2098	20	2151	37	2,525292774	2,05	0,12631087	1,15
120059A_98	no comm	413560	0,0042	76	74	184	0,1190	0,0013	5,843	0,131	0,356	0,007	0,87	101	1941	19	1953	19	1964	34	2,808337847	2,04	0,11901014	1,09
120059A_99	0	636947	0,0027	133	255	288	0,1185	0,0012	5,725	0,127	0,350	0,007	0,89	100	1934	18	1935	19	1936	34	2,853987931	2,03	0,11849472	1,02
120059A_100	0	431112	0,0040	88	89	142	0,1907	0,0019	12,623	0,278	0,480	0,010	0,89	92	2748	16	2652	21	2527	42	2,083255034	2,03	0,19072311	0,99
120059A_101	0	434082	0,0040	94	96	142	0,2022	0,0020	13,455	0,297	0,483	0,010	0,89	89	2844	16	2712	21	2539	43	2,071602724	2,04	0,20216378	0,99
120059A_102	0	189898	0,0091	34	23	82	0,1173	0,0016	5,898	0,141	0,365	0,008	0,82	105	1916	25	1961	21	2004	36	2,742728348	2,07	0,11732304	1,38
120059A_103	0	186728	0,0092	37	61	77	0,1305	0,0016	6,942	0,160	0,386	0,008	0,85	100	2105	21	2104	20	2103	37	2,592153313	2,05	0,13051472	1,20
120059A_104	0	471933	0,0036	91	122	222	0,1259	0,0015	5,829	0,134	0,336	0,007	0,85	91	2041	21	1951	20	1867	33	2,977752526	2,05	0,12589507	1,19
120059A_105	0	334397	0,0051	65	85	148	0,1243	0,0015	6,123	0,140	0,357	0,007	0,86	98	2019	21	1994	20	1969	35	2,79874024	2,05	0,12429291	1,17

Appendix 3(3) U-Pb analyses.

				Pb	Th	U									Derived ages and errors						T-W (Pbc corrected)			
Sample	Comment	Pb206/Pb204	206Pbc(%)	ppm			207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	r	% Concordance	207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	238U/206Pb	1s %	207Pb/206Pb	1s %
120063A_01	0	179672	0,0096	56	91	81	0,1823	0,0006	12,429	0,251	0,494	0,010	0,99	97	2674	6	2637	19	2590	43	2,022811824	2,01	0,182338867	0,34
120063A_02	inclusions	1411790	0,0012	351	136	886	0,1151	0,0004	5,667	0,114	0,357	0,007	0,99	105	1882	6	1926	17	1968	34	2,800987811	2,00	0,115126205	0,32
120063A_03	0	337978	0,0051	89	82	219	0,1169	0,0005	5,563	0,113	0,345	0,007	0,98	100	1909	7	1910	17	1912	33	2,89698713	2,01	0,116890237	0,41
120063A_04	0	272826	0,0063	68	32	177	0,1164	0,0004	5,548	0,112	0,346	0,007	0,98	101	1902	7	1908	17	1914	33	2,892537974	2,01	0,116395765	0,38
120063A_05	inclusions	128802	0,0134	33	27	77	0,1167	0,0005	6,065	0,123	0,377	0,008	0,98	108	1906	7	1985	18	2062	35	2,652532361	2,01	0,116682366	0,41
120063A_06	0	5338	0,3225	159	341	460	0,1445	0,0005	5,536	0,112	0,278	0,006	0,99	69	2282	6	1906	17	1580	28	3,59986386	2,00	0,144535398	0,34
120063A_07	0	1342217	0,0013	325	24	863	0,1181	0,0004	5,674	0,114	0,349	0,007	0,99	100	1927	6	1927	17	1927	33	2,869379324	2,00	0,118087841	0,32
120063A_08	0	367691	0,0047	103	154	226	0,1232	0,0004	6,200	0,125	0,365	0,007	0,98	100	2003	6	2004	18	2005	34	2,740331744	2,00	0,123216583	0,35
120063A_09	0	318439	0,0054	95	204	209	0,1157	0,0005	5,458	0,111	0,342	0,007	0,98	100	1891	7	1894	17	1896	33	2,923969252	2,01	0,115740559	0,40
120063A_10	short	764372	0,0023	202	196	492	0,1179	0,0004	5,657	0,114	0,348	0,007	0,98	100	1924	7	1925	17	1926	33	2,872638568	2,00	0,117855837	0,37
120063A_11	0	673273	0,0026	181	237	448	0,1141	0,0003	5,305	0,107	0,337	0,007	0,99	100	1866	6	1870	17	1873	32	2,965496771	2,00	0,114108937	0,31
120063A_12	0	244176	0,0070	71	138	159	0,1169	0,0004	5,540	0,112	0,344	0,007	0,98	100	1909	7	1907	17	1904	33	2,909624829	2,00	0,116901299	0,37
120063A_13	0	347371	0,0050	88	53	225	0,1173	0,0004	5,597	0,113	0,346	0,007	0,98	100	1915	7	1916	17	1916	33	2,889421045	2,00	0,117293454	0,37
120063A_14	0	410500	0,0042	122	106	182	0,2157	0,0007	15,046	0,303	0,506	0,010	0,99	90	2949	5	2818	19	2639	43	1,976541453	2,00	0,215684405	0,32
120063A_15	0	718040	0,0024	209	254	347	0,1597	0,0005	10,225	0,206	0,464	0,009	0,99	100	2452	5	2455	18	2459	41	2,153126857	2,00	0,159674163	0,31
120063A_16	0	303203	0,0057	88	170	196	0,1180	0,0004	5,661	0,114	0,348	0,007	0,98	100	1926	6	1925	17	1925	33	2,874446674	2,00	0,118012834	0,36
120063A_17	inclusions	271154	0,0063	66	7	157	0,1153	0,0005	6,154	0,125	0,387	0,008	0,98	112	1884	8	1998	18	2110	36	2,5822006	2,01	0,115256142	0,45
120063A_18	0	1124009	0,0015	282	128	715	0,1175	0,0004	5,715	0,115	0,353	0,007	0,99	101	1919	6	1934	17	1948	34	2,835181777	2,00	0,117516381	0,34
120063A_19	0	212875	0,0081	56	49	137	0,1179	0,0005	5,665	0,115	0,349	0,007	0,98	100	1924	8	1926	17	1928	33	2,869300349	2,01	0,1178807	0,43
120063A_20	rising ratios	96069	0,0179	24	2	50	0,1396	0,0007	8,382	0,171	0,436	0,009	0,97	105	2222	8	2273	18	2330	39	2,296209863	2,01	0,139594789	0,48
120063A_21	0	774431	0,0022	221	199	378	0,1594	0,0005	10,103	0,203	0,460	0,009	0,99	100	2449	5	2444	18	2438	41	2,175525007	2,00	0,159416989	0,30
120063A_22	0	643476	0,0027	159	51	418	0,1172	0,0004	5,585	0,113	0,346	0,007	0,98	100	1913	7	1914	17	1914	33	2,892365763	2,01	0,117158097	0,38
120063A_23	0	194594	0,0088	52	59	128	0,1161	0,0006	5,471	0,112	0,342	0,007	0,97	100	1896	9	1896	17	1896	33	2,924821276	2,01	0,116054731	0,53
120063A_24	short	422957	0,0041	113	128	294	0,1162	0,0009	5,182	0,111	0,323	0,007	0,93	95	1899	14	1850	18	1806	32	3,092268906	2,03	0,116211738	0,80
120063A_25	0	259610	0,0066	68	64	165	0,1182	0,0005	5,744	0,116	0,352	0,007	0,98	101	1930	7	1938	17	1946	34	2,83826313	2,01	0,118230427	0,39
120063A_26	0	712150	0,0024	182	93	414	0,1311	0,0004	6,989	0,141	0,387	0,008	0,99	100	2112	5	2110	18	2108	36	2,585650556	2,00	0,131058906	0,31
120063A_27	common Pb	2647	0,6504	89	151	156	0,1136	0,0004	6,458	0,131	0,412	0,008	0,98	120	1858	7	2040	18	2225	38	2,425621737	2,01	0,113607387	0,38
120063A_28	0	439907	0,0039	121	87	210	0,1622	0,0005	10,498	0,212	0,470	0,009	0,99	100	2478	6	2480	19	2482	41	2,129780968	2,00	0,162159127	0,34
120063A_29	0	1925878	0,0009	580	609	755	0,1970	0,0006	15,555	0,313	0,573	0,011	0,99	104	2802	5	2850	19	2919	47	1,746258007	2,00	0,197002468	0,28
120063A_30	0	368339	0,0047	96	74	227	0,1233	0,0005	6,186	0,125	0,364	0,007	0,98	100	2005	7	2003	18	2000	34	2,749067592	2,01	0,123341433	0,37
120063A_31	0	309620	0,0056	84	48	132	0,1825	0,0006	13,309	0,268	0,529	0,011	0,99	102	2676	5	2702	19	2736	45	1,891189474	2,00	0,18254487	0,31
120063A_32	0	489570	0,0035	134	151	293	0,1238	0,0004	6,397	0,129	0,375	0,008	0,98	102	2011	6	2032	18	2052	35	2,667655834	2,00	0,123769705	0,36
120063A_33	0	487902	0,0035	138	192	290	0,1169	0,0004	6,097	0,123	0,378	0,008	0,99	108	1909	6	1990	17	2068	35	2,643174831	2,00	0,116882998	0,32
120063A_34	0	372690	0,0046	102	141	243	0,1166	0,0004	5,539	0,112	0,345	0,007	0,98	100	1904	6	1907	17	1909	33	2,901357147	2,00	0,116553144	0,36
120063A_35	0	218065	0,0079	58	60	133	0,1249	0,0005	6,346	0,129	0,369	0,007	0,98	100	2027	7	2025	18	2023	35	2,712755538	2,01	0,124853669	0,41
120063A_36	0	1165882	0,0015	318	266	581	0,1485	0,0005	9,237	0,186	0,451	0,009	0,99	103	2329	5	2362	18	2400	40	2,217174826	2,00	0,148540318	0,30
120063A_37	0	242108	0,0071	64	70	155	0,1221	0,0004	5,900	0,119	0,350	0,007	0,99	97	1987	6	1961	17	1936	33	2,854127965	2,00	0,122123552	0,35
120063A_38	0	743916	0,0023	219	222	335	0,1861	0,0006	12,815	0,258	0,500	0,010	0,99	96	2708	5	2666	19	2612	43	2,001911524	2,00	0,186060469	0,30
120063A_39	0	451429	0,0038	124	180	289	0,1178	0,0004	5,712	0,115	0,352	0,007	0,99	101	1923	6	1933	17	1943	34	2,843624933	2,00	0,11779382	0,34
120063A_40	0	10702	0,1609	288	91	1101	0,1121	0,0004	3,713	0,075	0,240	0,005	0,99	76	1834	6	1574	16	1388	25	4,163110066	2,00	0,112117404	0,32
120063A_41	0	1277436	0,0013	401	300	390	0,2708	0,0007	27,495	0,552	0,736	0,015	0,99	107	3311	4	3401	19	3557	55	1,357943512	2,00	0,27078928	0,27
120063A_42	0	309922	0,0056	87	54	127	0,2000	0,0006	15,188	0,306	0,551	0,011	0,99	100	2826	5	2827	19	2829	46	1,815494938	2,00	0,199983531	0,31
120063A_43	end of run	469583	0,0037	113	12	300	0,1176	0,0006	5,717	0,117	0,353	0,007	0,97	101	1920	9	1934	18	1947	34	2,836133318	2,01	0,117587081	0,48
~~120063A_44~~	~~Bad~~	~~120029~~	~~0,0143~~	~~33~~	~~39~~	~~64~~	~~0,1345~~	~~0,0008~~	~~7,776~~	~~0,161~~	~~0,44~~	~~0,004~~	~~0,9~~	~~10~~	~~215~~	~~10~~	~~220~~	~~18~~	~~225~~	~~3~~	~~2,38510537~~	~~2,0~~	~~0,13451916~~	~~0,5~~
120063A_45	0	177253	0,0097	48	53	115	0,1180	0,0006	5,655	0,116	0,348	0,007	0,97	100	1926	9	1924	18	1923	33	2,876646094	2,01	0,117973577	0,52
120063A_46	0	335151	0,0051	87	56	205	0,1249	0,0004	6,341	0,128	0,368	0,007	0,98	100	2028	6	2024	18	2021	35	2,716229303	2,00	0,12492311	0,33
120063A_47	short	659447	0,0026	159	11	423	0,1169	0,0005	5,661	0,115	0,351	0,007	0,98	102	1909	7	1925	17	1940	34	2,84711072	2,01	0,116891365	0,40
120063A_48	0	1300868	0,0013	320	109	857	0,1132	0,0003	5,330	0,107	0,342	0,007	0,99	102	1851	5	1874	17	1894	33	2,927621928	2,00	0,113180183	0,31
120063A_49	0	1834022	0,0009	488	75	723	0,2121	0,0006	16,690	0,335	0,571	0,011	0,99	100	2922	4	2917	19	2911	47	1,752199074	2,00	0,212105201	0,27
120063A_50	0	626780	0,0027	162	35	288	0,1723	0,0005	11,657	0,235	0,491	0,010	0,99	100	2580	5	2577	19	2573	42	2,038380322	2,00	0,172338838	0,31
120063A_51	0	273825	0,0063	75	87	164	0,1257	0,0005	6,513	0,132	0,376	0,008	0,98	101	2039	7	2048	18	2056	35	2,66163128	2,01	0,125732143	0,40
120063A_52	0	1057613	0,0016	306	579	698	0,1160	0,0004	5,460	0,110	0,341	0,007	0,99	100	1896	6	1894	17	1893	33	2,929744705	2,00	0,116016384	0,32
120063A_53	0	384913	0,0045	106	133	237	0,1270	0,0004	6,415	0,129	0,366	0,007	0,99	98	2057	6	2034	17	2012	35	2,729802153	2,00	0,127011808	0,33
120063A_54	0	158894	0,0108	43	55	104	0,1170	0,0007	5,564	0,115	0,345	0,007	0,96	100	1911	10	1911	18	1910	33	2,899750675	2,01	0,117020176	0,57
120063A_55	0	349830	0,0049	90	62	226	0,1179	0,0005	5,675	0,115	0,349	0,007	0,98	100	1925	7	1928	17	1930	33	2,864863824	2,01	0,117911529	0,40
120063A_56	short	440105	0,0039	127	228	289	0,1163	0,0005	5,498	0,112	0,343	0,007	0,98	100	1900	7	1900	17	1900	33	2,91707012	2,01	0,116320972	0,45
120063A_57	0	521448	0,0033	164	404	325	0,1224	0,0004	6,109	0,123	0,362	0,007	0,99	100	1991	6	1991	17	1991	34	2,763880984	2,00	0,12244919	0,33
120063A_58	0	521826	0,0033	152	152	235	0,1766	0,0005	12,198	0,246	0,501	0,010	0,99	100	2621	5	2620	19	2618	43	1,996186979	2,00	0,176594909	0,31
120063A_59	inclusions	609811	0,0028	162	178	409	0,1131	0,0004	5,248	0,106	0,336	0,007	0,99	101	1851	6	1860	17	1868	32	2,972836305	2,00	0,113148751	0,32
120063A_60	0	153641	0,0112	51	156	100	0,1168	0,0005	5,557	0,113	0,345	0,007	0,98	100	1908	8	1909	17	1911	33	2,897878265	2,01	0,116785646	0,43
120063A_61	0	29649	0,0581	8	5	12	0,2110	0,0014	16,539	0,346	0,569	0,012	0,95	100	2913	11	2908	20	2902	47	1,758909599	2,04	0,210986691	0,68
120063A_62	0	1105755	0,0016	317	124	389	0,2544	0,0007	22,489	0,452	0,641	0,013	0,99	99	3212	4	3205	19	3194	50	1,559477023	2,00	0,254352068	0,29
120063A_63	0	274824	0,0063	72	53	170	0,1244	0,0004	6,266	0,127	0,365	0,007	0,98	99	2020	6	2014	18	2007	34	2,7376507	2,00	0,124413739	0,36
120063A_64	0	150838	0,0114	41	57	125	0,1181	0,0005	4,417	0,090	0,271	0,005	0,98	80	1928	8	1716	17	1547	28	3,686965335	2,01	0,118119355	0,40
120063A_65	0	411522	0,0042	138	417	263	0,1189	0,0004	5,792	0,117	0,353	0,007	0,99	101	1940	6	1945	17	1950	34	2,831017641	2,00	0,118929467	0,32
120063A_66	0	4548	0,3785	98	103	220	0,1223	0,0004	6,272	0,127	0,372	0,007	0,98	102	1990	6	2015	18	2038	35	2,689448535	2,00	0,122333515	0,35
120063A_67	0	248371	0,0069	68	94	162	0,1174	0,0005	5,613	0,114	0,347	0,007	0,98	100	1917	7	1918	17	1919	33	2,884297015	2,01	0,117409067	0,38
120063A_68	0	217678	0,0079	61	96	142	0,1177	0,0005	5,602	0,113	0,345	0,007	0,98	99	1922	7	1916	17	1911	33	2,897435668	2,01	0,117715937	0,38
120063A_69	0	375025	0,0046	97	83	248	0,1149	0,0004	5,417	0,110	0,342	0,007	0,98	101	1878	7	1888	17	1896	33	2,924526358	2,01	0,114891096	0,39

Appendix 3(4) U-Pb analyses.

120063A_7 0	0	333511	0,0052	105	108	122	0,2214	0,0008	18,836	0,380	0,617	0,012	0,98	104	2991	6	3033	19	3098	49	1,620553668	2,01	0,22138128 4	0,35
120063A_7 1	0	2621137	0,0007	654	292	1718	0,1166	0,0003	5,535	0,111	0,344	0,007	0,99	100	1904	5	1906	17	1908	33	2,903652211	2,00	0,11656792 9	0,29
120063A_7 2	inclusions	6292	0,2736	99	48	293	0,1135	0,0004	4,763	0,096	0,304	0,006	0,99	92	1856	6	1778	17	1713	30	3,286057749	2,00	0,11351301 2	0,33
120063A_7 3	0	480575	0,0036	131	119	252	0,1463	0,0005	8,675	0,175	0,430	0,009	0,99	100	2303	6	2304	18	2306	39	2,32572381	2,00	0,14632017 4	0,33
120063A_7 4	0	725148	0,0024	203	145	315	0,1853	0,0006	13,270	0,267	0,519	0,010	0,99	100	2701	5	2699	19	2696	44	1,925496809	2,00	0,18531044 7	0,30
120063A_7 5	0	213649	0,0081	59	32	87	0,1995	0,0007	15,248	0,308	0,554	0,011	0,99	101	2822	6	2831	19	2843	46	1,804049304	2,01	0,19950972 5	0,35
120063A_7 6	0	635785	0,0027	158	65	407	0,1182	0,0004	5,744	0,116	0,353	0,007	0,98	101	1929	6	1938	17	1947	34	2,836719501	2,00	0,11818362 5	0,36
120063A_7 7	0	361204	0,0048	97	115	226	0,1217	0,0005	6,067	0,123	0,362	0,007	0,98	100	1981	7	1985	17	1990	34	2,765510245	2,00	0,12168431 2	0,37
120063A_7 8	0	324813	0,0053	90	119	199	0,1233	0,0005	6,272	0,127	0,369	0,007	0,98	101	2004	7	2015	18	2025	35	2,709620695	2,01	0,12326629 2	0,39
120063A_7 9	0	529266	0,0033	140	142	342	0,1180	0,0004	5,688	0,115	0,349	0,007	0,98	100	1927	6	1930	17	1932	33	2,861328488	2,00	0,11803294 2	0,35
120063A_8 0	0	117801	0,0146	35	33	51	0,1877	0,0008	13,568	0,276	0,524	0,011	0,98	100	2722	7	2720	19	2717	44	1,907254839	2,01	0,18768751 2	0,42
120063A_8 1	0	113651	0,0151	35	79	69	0,1261	0,0006	6,462	0,132	0,372	0,007	0,97	100	2045	8	2041	18	2037	35	2,690938104	2,01	0,12612115 3	0,47
120063A_8 2	0	182012	0,0095	55	76	88	0,1624	0,0007	10,492	0,213	0,468	0,009	0,98	100	2481	7	2479	19	2477	41	2,134610454	2,01	0,16242940 6	0,41
120063A_8 3	0	526696	0,0033	144	168	310	0,1240	0,0004	6,568	0,133	0,384	0,008	0,98	104	2014	6	2055	18	2096	36	2,602498549	2,00	0,12397453 9	0,36
120063A_8 4	0	147099	0,0117	43	78	91	0,1219	0,0006	6,157	0,126	0,366	0,007	0,97	101	1984	9	1998	18	2013	35	2,729029176	2,01	0,12185581 9	0,50
120063A_8 5	0	297307	0,0058	74	27	192	0,1180	0,0005	5,711	0,116	0,351	0,007	0,98	101	1926	8	1933	17	1939	34	2,84925298	2,01	0,11801896 7	0,45
120063A_8 6	0	254912	0,0068	69	82	156	0,1239	0,0005	6,302	0,128	0,369	0,007	0,98	101	2013	7	2019	18	2024	35	2,710865033	2,01	0,12389635	0,41
120063A_8 7	0	655357	0,0026	188	159	295	0,1923	0,0006	13,308	0,268	0,502	0,010	0,99	95	2762	5	2702	19	2622	43	1,99256154	2,00	0,19232312 1	0,31
120063A_8 8	0	351705	0,0049	111	300	234	0,1126	0,0005	5,281	0,107	0,340	0,007	0,98	102	1842	7	1866	17	1887	33	2,940342021	2,01	0,11261368 2	0,41
120063A_8 9	0	280679	0,0061	70	31	184	0,1169	0,0005	5,571	0,113	0,346	0,007	0,98	100	1909	8	1912	17	1914	33	2,892982095	2,01	0,11689617 8	0,42
120063A_9 0	0	183519	0,0094	50	69	150	0,1159	0,0006	4,416	0,090	0,276	0,006	0,97	83	1894	9	1715	17	1573	28	3,618614063	2,01	0,11588579	0,50
120063A_9 1	0	268645	0,0064	79	79	116	0,1862	0,0007	13,502	0,273	0,526	0,011	0,98	101	2709	6	2715	19	2724	44	1,901814305	2,01	0,18623869	0,36
120063A_9 2	0	39024	0,0441	10	12	26	0,1141	0,0011	5,393	0,118	0,343	0,007	0,90	102	1866	17	1884	19	1900	33	2,918023889	2,04	0,11413015 6	0,93
120063A_9 3	0	157326	0,0109	46	85	95	0,1253	0,0005	6,464	0,132	0,374	0,008	0,98	101	2032	8	2041	18	2049	35	2,672028545	2,01	0,12526036 3	0,44
120063A_9 4	0	413055	0,0042	126	162	183	0,1834	0,0006	12,916	0,260	0,511	0,010	0,99	99	2684	5	2674	19	2660	44	1,957743244	2,00	0,18339061 7	0,33
120063A_9 5	0	646123	0,0027	169	157	431	0,1147	0,0004	5,359	0,109	0,339	0,007	0,98	100	1874	7	1878	17	1882	33	2,95012583	2,00	0,11465558	0,39
120063A_9 6	0	124666	0,0138	34	40	81	0,1177	0,0006	5,662	0,116	0,349	0,007	0,97	100	1921	8	1926	17	1930	33	2,865305789	2,01	0,11765581 9	0,47
120063A_9 7	0	892450	0,0019	240	303	596	0,1146	0,0004	5,349	0,108	0,339	0,007	0,99	100	1873	6	1877	17	1880	33	2,95315194	2,00	0,11456449 9	0,34
120063A_9 8	0	781412	0,0022	208	120	404	0,1499	0,0005	9,044	0,182	0,438	0,009	0,99	100	2344	6	2342	18	2340	39	2,284787487	2,00	0,14987108 7	0,32
120063A_9 9	0	652528	0,0026	183	129	289	0,1817	0,0006	12,800	0,258	0,511	0,010	0,99	100	2668	5	2665	19	2661	44	1,956942705	2,00	0,18167211 6	0,32
120063A_100	0	364480	0,0047	98	94	217	0,1296	0,0005	6,793	0,137	0,380	0,008	0,98	99	2092	7	2085	18	2077	36	2,630375222	2,00	0,12958806	0,38
120063A_101	0	379519	0,0045	96	57	248	0,1165	0,0004	5,574	0,113	0,347	0,007	0,98	101	1904	7	1912	17	1920	33	2,882618511	2,00	0,11652795 2	0,37
120063A_102	0	704674	0,0024	170	10	457	0,1161	0,0004	5,594	0,113	0,349	0,007	0,98	102	1897	7	1915	17	1931	33	2,862509732	2,00	0,11612685 3	0,38

Appendix 3(5) U-Pb analyses.

				Pb	Th	U									Derived ages and errors						T-W (Pbc corrected)			
Sample	Comment	Pb206/Pb2	206Pbc(%)	ppm			207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	r	% Concordance	207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	238U/206Pb	1s %	207Pb/206Pb	1s %
120071A_01	common Pb	3395	0,5071	59	125	129	0,1203	0,0004	5,647	0,114	0,340	0,007	0,98	96	1961	6	1923	17	1888	33	2,938190828	2,00	0,12033266 1	0,36
120071A_02	0	242679	0,0071	55	123	90	0,1470	0,0005	8,689	0,176	0,429	0,009	0,98	100	2311	6	2306	18	2300	39	2,332614333	2,01	0,14699806 9	0,37
120071A_03	0	447343	0,0038	79	40	202	0,1191	0,0004	5,744	0,116	0,350	0,007	0,99	100	1942	6	1938	17	1934	33	2,858064052	2,00	0,11905841 1	0,33
120071A_04	0	331626	0,0052	70	106	119	0,1451	0,0006	8,844	0,179	0,442	0,009	0,98	103	2289	7	2322	18	2360	40	2,261908864	2,01	0,14509207 6	0,40
120071A_05	0	429907	0,0040	78	40	164	0,1416	0,0005	8,113	0,164	0,416	0,008	0,99	100	2247	6	2244	18	2240	38	2,406722884	2,00	0,14161559 7	0,33
120071A_06	0	645889	0,0027	130	111	194	0,1892	0,0006	13,738	0,277	0,527	0,011	0,99	100	2735	5	2732	19	2728	44	1,898640882	2,00	0,18918223 1	0,31
120071A_07	0	499250	0,0034	116	204	149	0,1904	0,0006	13,922	0,280	0,530	0,011	0,99	100	2745	5	2744	19	2743	45	1,885433004	2,00	0,19038032 8	0,31
120071A_08	0	322402	0,0053	61	61	136	0,1258	0,0005	6,520	0,132	0,376	0,008	0,98	101	2040	6	2049	18	2057	35	2,659841458	2,00	0,12578133 1	0,37
120071A_09	0	581979	0,0030	106	65	228	0,1363	0,0005	7,605	0,153	0,405	0,008	0,99	100	2181	6	2185	18	2191	37	2,470819622	2,00	0,13628638 5	0,33
120071A_10	0	292751	0,0059	60	104	121	0,1242	0,0005	6,582	0,133	0,384	0,008	0,98	104	2018	7	2057	18	2096	36	2,602133832	2,00	0,12422515 1	0,37
120071A_11	0	230560	0,0075	52	128	99	0,1247	0,0005	6,323	0,128	0,368	0,007	0,98	100	2024	7	2022	18	2019	35	2,718634085	2,01	0,12467993 9	0,38
120071A_12	0	245440	0,0070	47	62	112	0,1183	0,0005	5,653	0,115	0,347	0,007	0,98	99	1930	8	1924	17	1919	33	2,884693849	2,01	0,11827500 7	0,43
120071A_13	0	388847	0,0044	71	52	166	0,1240	0,0005	6,355	0,129	0,372	0,007	0,98	101	2014	8	2026	18	2037	35	2,690186094	2,01	0,12398528 1	0,44
120071A_14a	0	1428789	0,0012	241	15	641	0,1182	0,0004	5,759	0,116	0,353	0,007	0,99	101	1930	6	1940	17	1950	34	2,83098579	2,00	0,11824881 9	0,32
120071A_14b	0	1890559	0,0009	321	28	845	0,1204	0,0004	5,882	0,118	0,354	0,007	0,99	100	1962	5	1959	17	1955	34	2,821807988	2,00	0,12037095 4	0,29
120071A_15	0	562744	0,0031	125	195	191	0,1615	0,0005	10,379	0,209	0,466	0,009	0,99	100	2471	5	2469	18	2466	41	2,145553588	2,00	0,16150315 5	0,32
120071A_16	0	120448	0,0143	24	17	36	0,1890	0,0008	13,908	0,283	0,534	0,011	0,98	101	2733	7	2743	19	2757	45	1,873491365	2,01	0,18898124 4	0,45
120071A_17	inclusions	373454	0,0046	72	67	144	0,1298	0,0005	7,345	0,149	0,410	0,008	0,98	106	2095	6	2154	18	2217	37	2,436852029	2,00	0,12981419 2	0,37
120071A_18	short	744387	0,0023	146	164	292	0,1317	0,0007	7,329	0,150	0,404	0,008	0,97	103	2121	9	2152	18	2185	37	2,477847258	2,01	0,13170947 4	0,49
120071A_19	0	208489	0,0083	40	47	84	0,1324	0,0005	7,173	0,145	0,393	0,008	0,98	100	2130	7	2133	18	2136	36	2,545345557	2,01	0,13241686 8	0,40
120071A_20	0	353087	0,0049	63	31	140	0,1312	0,0005	7,212	0,146	0,399	0,008	0,98	102	2114	6	2138	18	2163	37	2,5084872	2,00	0,13121741 8	0,37
120071A_21	0	783514	0,0022	162	188	231	0,1938	0,0006	14,349	0,289	0,537	0,011	0,99	100	2775	5	2773	19	2770	45	1,862598824	2,00	0,19384001	0,31
120071A_22	0	1799165	0,0010	346	260	605	0,1633	0,0005	10,619	0,214	0,472	0,009	0,99	100	2490	5	2490	19	2491	41	2,120158766	2,00	0,16328138 1	0,30
120071A_23	0	353927	0,0049	64	36	147	0,1281	0,0005	6,736	0,137	0,381	0,008	0,98	100	2073	7	2077	18	2082	36	2,623144341	2,01	0,12814796 4	0,41
120071A_24	0	424931	0,0041	90	91	123	0,2000	0,0007	15,086	0,304	0,547	0,011	0,99	100	2827	5	2821	19	2813	46	1,82826779	2,00	0,20003829 5	0,33
120071A_25	0	985341	0,0017	190	224	409	0,1261	0,0004	6,635	0,134	0,382	0,008	0,99	102	2045	6	2064	18	2083	36	2,621174566	2,00	0,12614305 3	0,32
120071A_26	0	8507	0,2024	134	163	248	0,1458	0,0005	8,737	0,176	0,435	0,009	0,99	101	2297	6	2311	18	2327	39	2,300652143	2,00	0,14578854 8	0,34
120071A_27	short	304547	0,0057	64	61	85	0,2052	0,0010	16,037	0,328	0,567	0,011	0,97	101	2868	8	2879	19	2895	47	1,764388094	2,02	0,20521251 5	0,49
120071A_28	0	128907	0,0134	24	24	57	0,1204	0,0008	5,902	0,123	0,356	0,007	0,95	100	1962	11	1962	18	1961	34	2,812645393	2,02	0,12039943	0,64
120071A_29	0	596115	0,0029	117	69	173	0,1977	0,0007	14,885	0,300	0,546	0,011	0,99	100	2807	6	2808	19	2809	45	1,831124557	2,00	0,19768720 5	0,35
120071A_30	0	400381	0,0043	85	146	168	0,1281	0,0005	6,683	0,136	0,378	0,008	0,98	100	2072	7	2070	18	2069	35	2,642312014	2,01	0,12807210 8	0,41
120071A_31	0	1851	0,9298	37	15	56	0,1870	0,0009	13,903	0,284	0,539	0,011	0,97	102	2716	8	2743	19	2780	45	1,854325948	2,01	0,18698534 6	0,46
120071A_32	0	928234	0,0019	191	198	279	0,1866	0,0006	13,559	0,273	0,527	0,011	0,99	101	2712	5	2719	19	2729	44	1,897280754	2,00	0,18657793 2	0,33
120071A_33	inclusions	1085658	0,0016	204	191	435	0,1251	0,0004	6,834	0,138	0,396	0,008	0,99	106	2030	6	2090	18	2151	37	2,524089019	2,00	0,12510685	0,33
120071A_34	0	356211	0,0048	76	150	151	0,1241	0,0005	6,413	0,130	0,375	0,008	0,98	102	2016	7	2034	18	2052	35	2,668375666	2,00	0,12411248 2	0,38
120071A_35	0	327562	0,0053	64	49	116	0,1624	0,0006	10,023	0,202	0,448	0,009	0,98	96	2481	6	2437	18	2385	40	2,233970231	2,00	0,16240329 1	0,35
120071A_36	0	182745	0,0094	41	96	77	0,1236	0,0006	6,382	0,130	0,374	0,008	0,98	102	2009	8	2030	18	2051	35	2,670272022	2,01	0,12359347 8	0,45
120071A_37	0	600105	0,0029	109	77	256	0,1239	0,0005	6,355	0,128	0,372	0,007	0,98	101	2013	6	2026	18	2039	35	2,687586072	2,00	0,12387170 7	0,36
120071A_38	0	131727	0,0131	25	29	57	0,1215	0,0006	6,111	0,125	0,365	0,007	0,97	101	1978	9	1992	18	2005	35	2,740843999	2,01	0,12148451 6	0,51
120071A_39a	0	262334	0,0066	54	90	107	0,1323	0,0006	7,125	0,145	0,391	0,008	0,98	100	2129	7	2127	18	2125	36	2,560564578	2,01	0,13231840 8	0,42
120071A_39b	0	1629226	0,0011	308	293	653	0,1317	0,0004	7,188	0,145	0,396	0,008	0,99	101	2121	6	2135	18	2149	37	2,527130712	2,00	0,13174508	0,34
120071A_40	0	365960	0,0047	68	52	156	0,1252	0,0006	6,432	0,131	0,373	0,007	0,98	101	2031	8	2037	18	2042	35	2,683278827	2,01	0,12517390 1	0,44
120071A_41	0	827233	0,0021	152	161	359	0,1199	0,0004	6,048	0,122	0,366	0,007	0,99	103	1955	6	1983	17	2010	35	2,733082888	2,00	0,11989365 8	0,35
120071A_42	0	243874	0,0071	49	86	123	0,1286	0,0005	5,556	0,113	0,313	0,006	0,98	85	2079	7	1909	17	1757	31	3,191551389	2,01	0,12861098 9	0,39
120071A_43	short	877495	0,0020	176	241	371	0,1275	0,0006	6,598	0,134	0,375	0,008	0,98	99	2064	8	2059	18	2054	35	2,665135	2,01	0,12753158 8	0,44
120071A_44	0	321215	0,0054	65	63	125	0,1875	0,0006	10,578	0,213	0,409	0,008	0,99	81	2720	6	2487	19	2211	37	2,443544977	2,00	0,18745849	0,34
120071A_45	0	1887413	0,0009	394	99	403	0,3231	0,0010	33,105	0,666	0,743	0,015	0,99	100	3585	5	3584	20	3582	55	1,345839214	2,00	0,32313515 2	0,30
120071A_46	0	319330	0,0054	67	112	133	0,1263	0,0005	6,656	0,135	0,382	0,008	0,98	102	2047	8	2067	18	2087	36	2,615297804	2,01	0,12625756 3	0,43
120071A_47	inclusions	6745	0,2552	188	833	1457	0,1170	0,0004	1,703	0,034	0,106	0,002	0,99	34	1911	6	1009	13	647	12	9,475516885	2,00	0,11700117 9	0,34
120071A_48	0	1614	1,0667	30	35	67	0,1193	0,0005	6,017	0,122	0,366	0,007	0,98	103	1945	7	1978	18	2010	35	2,732718472	2,01	0,11925884 4	0,41
120071A_49	0	9240	0,1863	92	95	135	0,1848	0,0006	13,235	0,267	0,520	0,010	0,99	100	2696	6	2697	19	2697	44	1,924820472	2,00	0,18476725 3	0,34
120071A_50	0	508145	0,0034	96	85	206	0,1314	0,0005	7,088	0,143	0,391	0,008	0,98	100	2117	6	2123	18	2128	36	2,556883304	2,00	0,13144734 2	0,36
120071A_51	0	561823	0,0031	111	158	241	0,1254	0,0004	6,407	0,129	0,371	0,007	0,98	100	2034	6	2033	18	2033	35	2,697385336	2,00	0,12535102 5	0,35
120071A_52	0	268680	0,0064	53	95	115	0,1232	0,0006	6,288	0,128	0,370	0,007	0,97	101	2003	8	2017	18	2030	35	2,701629979	2,01	0,12320006 8	0,46
120071A_53	common Pb	549	3,1346	46	84	83	0,1095	0,0005	5,524	0,112	0,366	0,007	0,98	112	1791	8	1904	17	2011	35	2,732194176	2,01	0,10946343 7	0,43
120071A_54	0	163179	0,0105	33	61	70	0,1255	0,0006	6,442	0,132	0,372	0,007	0,97	100	2036	9	2038	18	2040	35	2,685989737	2,01	0,12548778 8	0,51
120071A_55	0	457471	0,0038	92	149	203	0,1193	0,0005	5,873	0,119	0,357	0,007	0,98	101	1946	8	1957	17	1968	34	2,801700048	2,01	0,11932914 5	0,43
120071A_56	inclusions	330862	0,0052	68	125	139	0,1250	0,0006	6,526	0,133	0,379	0,008	0,97	102	2029	8	2049	18	2070	35	2,640581972	2,01	0,12498444 9	0,46
120071A_57	0	149403	0,0115	32	33	40	0,2229	0,0012	18,277	0,375	0,595	0,012	0,97	100	3002	8	3004	20	3008	48	1,681771655	2,02	0,22292874 2	0,52
120071A_58	0	189494	0,0091	38	33	58	0,1845	0,0007	13,205	0,268	0,519	0,010	0,98	100	2694	7	2694	19	2695	44	1,926376643	2,01	0,18448745 4	0,40
120071A_59	0	266978	0,0064	71	154	77	0,2005	0,0008	15,314	0,310	0,554	0,011	0,98	100	2830	6	2835	19	2842	46	1,805201523	2,01	0,20050290 7	0,39
120071A_60	inclusions	20972	0,0821	269	92	600	0,1211	0,0004	6,665	0,134	0,399	0,008	0,99	110	1972	6	2068	18	2166	37	2,504411921	2,00	0,12106355 1	0,33
120071A_61	0	290051	0,0059	58	86	127	0,1177	0,0006	5,886	0,120	0,363	0,007	0,97	104	1922	8	1959	18	1994	34	2,758131597	2,01	0,11773785	0,47
120071A_62	0	136745	0,0126	26	13	39	0,1983	0,0008	15,166	0,308	0,555	0,011	0,98	101	2812	7	2826	19	2845	46	1,802692603	2,01	0,19828387 2	0,42
120071A_63	0	141191	0,0122	26	29	63	0,1181	0,0006	5,800	0,119	0,356	0,007	0,97	102	1928	9	1946	18	1964	34	2,807453471	2,01	0,11809900 4	0,48
120071A_64	0	288526	0,0060	53	45	128	0,1193	0,0006	5,906	0,121	0,359	0,007	0,97	102	1946	8	1962	18	1978	34	2,784856851	2,01	0,11929095 6	0,47

Appendix 3(6) U-Pb analyses.

120071A_65	0	198235	0,0087	38	31	69	0,1603	0,0006	10,112	0,205	0,457	0,009	0,98	99	2459	6	2445	19	2428	40	2,18600474 2	2,01	0,160323848	0,38
120071A_66	0	79352	0,0217	16	25	33	0,1276	0,0007	6,720	0,139	0,382	0,008	0,96	101	2065	10	2075	18	2085	36	2,61843716 9	2,01	0,1276112	0,58
120071A_67	0	249337	0,0069	52	50	75	0,1884	0,0009	13,691	0,280	0,527	0,011	0,97	100	2728	8	2729	19	2729	45	1,89735768 2	2,01	0,188398842	0,48
120071A_68a	0	568687	0,0030	121	86	143	0,2426	0,0008	21,201	0,428	0,634	0,013	0,99	101	3137	5	3148	19	3164	50	1,57785170 6	2,00	0,242622627	0,34
120071A_68b	0	5160	0,3336	72	62	140	0,2163	0,0008	11,822	0,239	0,396	0,008	0,98	73	2953	6	2590	19	2153	37	2,52225446 3	2,01	0,216265732	0,37
120071A_69	0	135824	0,0127	25	28	62	0,1171	0,0006	5,646	0,116	0,350	0,007	0,97	101	1913	9	1923	18	1933	33	2,86026487 7	2,01	0,117114062	0,52
120071A_70	0	2260	0,7616	51	115	77	0,1557	0,0007	10,072	0,205	0,469	0,009	0,98	103	2409	7	2441	19	2480	41	2,13082368 2	2,01	0,155658317	0,42
120071A_71	0	103763	0,0166	21	18	30	0,1978	0,0010	14,817	0,304	0,543	0,011	0,97	100	2808	8	2804	19	2797	46	1,84092707 8	2,02	0,197837616	0,51
120071A_72	0	399236	0,0043	76	78	154	0,1403	0,0005	7,958	0,161	0,411	0,008	0,98	100	2231	7	2226	18	2221	38	2,43120545	2,01	0,140320537	0,39
120071A_73	0	104222	0,0165	20	26	47	0,1176	0,0006	5,653	0,116	0,349	0,007	0,97	100	1920	9	1924	17	1928	33	2,86773798 1	2,01	0,117576377	0,49
120071A_74	0	582375	0,0030	105	53	251	0,1315	0,0005	6,694	0,135	0,369	0,007	0,98	96	2118	6	2072	18	2025	35	2,70889438 3	2,00	0,131514427	0,36
120071A_75	0	470627	0,0037	96	147	186	0,1346	0,0005	7,458	0,151	0,402	0,008	0,98	101	2159	7	2168	18	2177	37	2,48867256	2,01	0,134612761	0,39
120071A_76	0	172570	0,0100	32	28	82	0,1211	0,0005	5,558	0,113	0,333	0,007	0,98	94	1972	8	1910	17	1853	32	3,00295678	2,01	0,121053366	0,45
120071A_77	0	208338	0,0083	45	68	74	0,1619	0,0006	9,941	0,201	0,445	0,009	0,98	96	2476	6	2429	19	2374	40	2,24612074 9	2,01	0,161945423	0,38
120071A_78	0	146189	0,0118	33	49	43	0,1963	0,0009	14,541	0,297	0,537	0,011	0,97	99	2796	8	2786	19	2772	45	1,86135901 6	2,01	0,196301419	0,48
120071A_79	0	308123	0,0056	63	114	132	0,1239	0,0006	6,347	0,129	0,372	0,007	0,98	101	2013	8	2025	18	2037	35	2,69070321 3	2,01	0,123860046	0,45
120071A_80	0	148029	0,0116	29	41	64	0,1244	0,0006	6,319	0,129	0,368	0,007	0,97	100	2020	8	2021	18	2022	35	2,71394474 9	2,01	0,124377718	0,47
120071A_81	short	419494	0,0041	75	46	182	0,1242	0,0007	6,287	0,130	0,367	0,007	0,96	100	2017	10	2017	18	2016	35	2,72374166 9	2,01	0,124192131	0,59
120071A_82	0	287480	0,0060	53	43	128	0,1193	0,0005	5,854	0,119	0,356	0,007	0,98	101	1946	7	1954	17	1962	34	2,81115615 1	2,00	0,11934888	0,40
120071A_83	0	181174	0,0095	40	58	57	0,1857	0,0007	13,028	0,264	0,509	0,010	0,98	98	2704	6	2682	19	2652	43	1,9652282	2,01	0,185685407	0,39
120071A_84	0	598256	0,0029	117	60	167	0,2112	0,0007	16,612	0,335	0,571	0,011	0,99	100	2915	6	2913	19	2910	47	1,75278427 8	2,00	0,211175548	0,35
120071A_85	inclusions	318473	0,0054	58	40	130	0,1178	0,0005	6,316	0,128	0,389	0,008	0,98	110	1923	8	2021	18	2118	36	2,57155871 9	2,01	0,117797454	0,43
120071A_86	0	70500	0,0244	13	13	30	0,1233	0,0007	6,356	0,131	0,374	0,008	0,96	102	2005	10	2026	18	2047	35	2,67567325 7	2,01	0,123349418	0,57
120071A_87	0	270954	0,0064	57	54	74	0,2150	0,0008	17,183	0,347	0,580	0,012	0,98	100	2943	6	2945	19	2948	47	1,72504654 1	2,01	0,214976279	0,37
120071A_88	0	427290	0,0040	82	128	177	0,1303	0,0005	6,880	0,139	0,383	0,008	0,98	99	2102	6	2096	18	2090	36	2,61125988 8	2,00	0,130306377	0,37
120071A_89	0	409654	0,0042	77	79	171	0,1260	0,0005	6,614	0,134	0,381	0,008	0,98	102	2043	7	2061	18	2080	36	2,62617021	2,00	0,12597279	0,39
120071A_90	0	2730	0,6307	40	39	52	0,2013	0,0009	16,025	0,326	0,577	0,012	0,98	104	2837	7	2878	19	2938	47	1,73185182 5	2,01	0,201282735	0,43
120071A_91	0	125281	0,0137	25	37	53	0,1265	0,0007	6,525	0,135	0,374	0,008	0,96	100	2050	10	2049	18	2048	35	2,67371103 7	2,01	0,126530243	0,58
120071A_92	0	363558	0,0047	72	40	102	0,2085	0,0008	16,264	0,329	0,566	0,011	0,98	100	2894	6	2892	19	2891	47	1,76721855 1	2,01	0,208455676	0,37
120071A_93	0	2478	0,6946	47	67	63	0,1883	0,0007	13,521	0,274	0,521	0,010	0,98	99	2728	6	2717	19	2702	44	1,92055368	2,01	0,188336991	0,38
120071A_94	0	340615	0,0051	69	48	95	0,2117	0,0008	16,705	0,338	0,572	0,011	0,98	100	2919	6	2918	19	2917	47	1,74763228 3	2,01	0,211732123	0,38
120071A_95	short	793887	0,0022	143	82	337	0,1239	0,0006	6,389	0,131	0,374	0,008	0,97	102	2013	8	2031	18	2048	35	2,67348255 2	2,01	0,123880962	0,47
120071A_96	0	4169	0,4129	76	87	143	0,1284	0,0005	7,505	0,152	0,424	0,009	0,98	110	2076	7	2174	18	2278	38	2,35867188 7	2,01	0,12838599	0,41
120071A_97	0	253911	0,0068	49	73	108	0,1247	0,0006	6,435	0,131	0,374	0,008	0,97	101	2024	8	2037	18	2050	35	2,67159575 3	2,01	0,124681912	0,46
120071A_98	0	255913	0,0067	52	76	111	0,1229	0,0006	6,216	0,127	0,367	0,007	0,97	101	1999	9	2007	18	2014	35	2,72677048 1	2,01	0,122930374	0,49
120071A_99	0	498483	0,0035	88	39	214	0,1255	0,0005	6,414	0,130	0,371	0,007	0,98	100	2035	7	2034	18	2033	35	2,69675390 6	2,00	0,125450784	0,38
120071A_100	0	4467	0,3854	91	68	224	0,1149	0,0005	5,707	0,116	0,360	0,007	0,97	106	1878	8	1932	17	1984	34	2,77500068 1	2,01	0,114860649	0,45
120071A_101	0	238437	0,0072	47	59	100	0,1269	0,0006	6,636	0,135	0,379	0,008	0,97	101	2055	8	2064	18	2074	35	2,63569195 8	2,01	0,126851294	0,46

Appendix 3(7) U-Pb analyses.

				Pb	Th	U									Derived ages and errors						T-W (Pbc corrected)			
Sample	Comment	Pb206/Pb204	206Pbc(%)	ppm			207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	r	% Concordance	207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	238U/206Pb	1s %	207Pb/206Pb	1s %
120074B-a_01a	0	2592	0,6640	129	124	311	0,1128	0,0008	5,351	0,112	0,344	0,007	0,94	103	1845	13	1877	18	1906	33	2,90649698 6	2,02	0,11280814 8	0,70
120074B-a_01b	inclusions	803939	0,0021	135	5	528	0,1163	0,0008	3,851	0,081	0,240	0,005	0,94	73	1900	12	1604	17	1388	25	4,16382086 4	2,02	0,11630778 6	0,70
120074B-a_02	0	208626	0,0083	38	30	88	0,1245	0,0014	6,438	0,145	0,375	0,008	0,87	102	2021	20	2037	20	2054	36	2,66559112 7	2,05	0,12446105 6	1,11
120074B-a_03	0	464437	0,0037	82	46	211	0,1180	0,0010	5,662	0,121	0,348	0,007	0,92	100	1927	15	1926	18	1924	34	2,87455260 6	2,03	0,11804362 3	0,82
120074B-a_04	0	262473	0,0066	47	26	118	0,1193	0,0012	5,788	0,127	0,352	0,007	0,90	100	1945	17	1945	19	1944	34	2,84158538 4	2,04	0,11928128 6	0,98
120074B-a_05	0	151034	0,0114	30	45	65	0,1247	0,0015	6,325	0,145	0,368	0,008	0,86	100	2025	21	2022	20	2019	36	2,71905811 3	2,06	0,12473198 9	1,18
120074B-a_06	0	207105	0,0083	39	49	94	0,1177	0,0014	5,673	0,129	0,350	0,007	0,86	101	1922	21	1927	19	1933	34	2,86069066 7	2,06	0,11770509 7	1,15
120074B-a_07	tripped	977042	0,0018	185	182	380	0,1261	0,0009	7,059	0,148	0,406	0,008	0,94	107	2044	12	2119	18	2197	37	2,46293226 6	2,02	0,12608972 8	0,69
120074B-a_08	0	484398	0,0036	91	91	214	0,1183	0,0011	5,823	0,126	0,357	0,007	0,91	102	1931	16	1950	19	1967	34	2,80236488 1	2,03	0,11834803 5	0,90
120074B-a_09	0	293118	0,0059	53	38	131	0,1195	0,0010	5,801	0,125	0,352	0,007	0,92	100	1949	15	1947	18	1944	34	2,8405104	2,03	0,11950118 6	0,85
120074B-a_10	0	391835	0,0044	76	112	176	0,1190	0,0010	5,784	0,125	0,352	0,007	0,91	100	1942	16	1944	19	1946	34	2,83806432 9	2,03	0,11904691 6	0,88
120074B-a_11	uneven Pb r	1482773	0,0012	322	315	385	0,2070	0,0012	17,369	0,360	0,608	0,012	0,96	106	2883	10	2955	20	3064	49	1,64354297 9	2,02	0,20703867 1	0,60
120074B-a_12	0	83568	0,0206	15	11	37	0,1196	0,0018	5,830	0,142	0,354	0,007	0,80	100	1950	26	1951	21	1952	35	2,82839939 8	2,09	0,11959207 3	1,47
120074B-a_13	0	647010	0,0027	130	211	284	0,1177	0,0010	5,833	0,126	0,360	0,007	0,91	103	1921	16	1951	19	1980	35	2,78137072 3	2,03	0,11765586 6	0,87
120074B-a_14	0	274467	0,0063	49	24	110	0,1308	0,0012	7,094	0,153	0,393	0,008	0,91	101	2109	15	2123	19	2138	37	2,54225127 8	2,03	0,13079661 1	0,89
120074B-a_15	0	335877	0,0051	63	70	153	0,1191	0,0011	5,689	0,123	0,346	0,007	0,91	99	1943	16	1930	18	1917	34	2,88763838 1	2,03	0,11914234 3	0,88
120074B-a_16	inclusions	782190	0,0022	150	167	372	0,1171	0,0009	5,355	0,113	0,332	0,007	0,94	97	1913	13	1878	18	1846	32	3,01539067 4	2,02	0,11712097	0,74
120074B-a_17	0	450713	0,0038	88	52	134	0,1924	0,0014	14,099	0,296	0,532	0,011	0,94	99	2762	11	2756	20	2748	45	1,88124523 8	2,03	0,19236537 7	0,70
120074B-a_18	0	603717	0,0029	102	4	263	0,1220	0,0010	6,095	0,130	0,362	0,007	0,92	100	1986	14	1990	18	1993	35	2,76028420 4	2,03	0,12202666 3	0,81
120074B-a_19	0	381630	0,0045	75	121	174	0,1187	0,0009	5,666	0,120	0,346	0,007	0,93	99	1937	14	1926	18	1916	33	2,88894258 5	2,02	0,11870753 5	0,77
120074B-a_20	short	86161	0,0200	17	15	34	0,1332	0,0035	7,258	0,232	0,395	0,009	0,58	100	2141	45	2144	28	2146	43	2,53105869 9	2,34	0,13323578 8	2,64
120074B-a_21	0	256354	0,0067	45	14	114	0,1195	0,0015	5,872	0,137	0,356	0,007	0,84	101	1948	23	1957	20	1965	35	2,80530662 1	2,07	0,11946733 1	1,29
120074B-a_22	0	343341	0,0050	65	73	153	0,1189	0,0012	5,828	0,128	0,355	0,007	0,89	101	1940	18	1951	19	1961	34	2,81307003 7	2,04	0,11889732 7	0,99
120074B-a_23	0	194264	0,0089	34	16	88	0,1183	0,0016	5,714	0,136	0,350	0,007	0,82	100	1931	25	1933	20	1936	35	2,85508757 9	2,08	0,11831213	1,39
120074B-a_24	0	260289	0,0066	56	79	83	0,1751	0,0014	11,923	0,254	0,494	0,010	0,93	99	2607	13	2598	20	2588	43	2,02447731 4	2,03	0,17506846 6	0,80
120074B-a_25	0	349822	0,0049	72	135	149	0,1253	0,0011	6,394	0,137	0,370	0,008	0,92	100	2033	15	2031	19	2030	35	2,70136925 5	2,03	0,12526682 1	0,85
120074B-a_26	inclusions	316336	0,0054	60	58	137	0,1306	0,0014	6,581	0,147	0,365	0,007	0,88	95	2106	18	2057	19	2008	35	2,73653685 5	2,05	0,13061011 7	1,05
120074B-a_27	0	35959	0,0479	7	7	14	0,1338	0,0028	7,245	0,203	0,393	0,009	0,68	99	2148	36	2142	25	2135	40	2,54630100 3	2,21	0,13379171 8	2,08
120074B-a_28	0	712080	0,0024	131	132	421	0,1193	0,0010	4,397	0,094	0,267	0,005	0,93	78	1946	14	1712	17	1527	27	3,74139971 6	2,02	0,11932532 6	0,81
120074B-a_29	0	1618522	0,0011	284	130	714	0,1196	0,0008	5,905	0,123	0,358	0,007	0,95	101	1951	12	1962	18	1972	34	2,79392959 9	2,01	0,11964988 6	0,66
120074B-a_30	0	950484	0,0018	199	157	246	0,2299	0,0013	19,301	0,399	0,609	0,012	0,96	100	3051	9	3057	20	3066	49	1,64202813 4	2,01	0,22986123	0,58
120074B-a_31	0	575509	0,0030	106	84	235	0,1301	0,0011	6,924	0,149	0,386	0,008	0,91	100	2099	15	2102	19	2105	36	2,59024405	2,03	0,13006848 1	0,87
120074B-a_32	U tripped	449701	0,0038	83	65	181	0,1184	0,0009	6,397	0,136	0,392	0,008	0,93	110	1932	14	2032	18	2132	37	2,55185882 1	2,02	0,11839442	0,76
120074B-a_33	0	586041	0,0029	109	100	268	0,1174	0,0010	5,600	0,121	0,346	0,007	0,91	100	1917	16	1916	18	1915	34	2,89112018 9	2,03	0,11741978 9	0,87
120074B-a_34	0	783915	0,0022	135	36	360	0,1168	0,0010	5,541	0,119	0,344	0,007	0,92	100	1907	15	1907	18	1907	33	2,90568927 7	2,03	0,11676077 9	0,86
120074B-a_35	0	393774	0,0044	73	80	188	0,1178	0,0010	5,365	0,115	0,330	0,007	0,92	96	1923	15	1879	18	1840	32	3,02649994 5	2,03	0,11776295 4	0,85
120074B-a_36	0	649933	0,0026	116	22	223	0,1658	0,0011	10,542	0,220	0,461	0,009	0,95	97	2515	11	2484	19	2445	41	2,16820972 5	2,02	0,16577989 4	0,65
120074B-a_37	0	505634	0,0034	95	96	216	0,1249	0,0010	6,365	0,136	0,370	0,007	0,93	100	2027	14	2027	19	2028	35	2,70548489 6	2,02	0,12489974 1	0,80
120074B-a_38	0	303066	0,0057	64	127	134	0,1215	0,0014	5,973	0,136	0,357	0,007	0,86	99	1978	20	1972	20	1966	35	2,80365422 1	2,06	0,12146432 7	1,14
120074B-a_39	0	1066948	0,0016	201	184	433	0,1321	0,0008	7,092	0,147	0,389	0,008	0,96	100	2126	11	2123	18	2120	36	2,56803420 7	2,01	0,13208607 7	0,61
120074B-a_40	0	192257	0,0090	46	76	55	0,1897	0,0019	14,434	0,319	0,552	0,011	0,89	103	2740	17	2779	21	2833	47	1,81225139 2	2,07	0,18971304 6	1,01
120074B-a_41	0	217794	0,0079	41	37	98	0,1193	0,0014	5,784	0,131	0,352	0,007	0,87	100	1946	20	1944	19	1942	34	2,84466483	2,05	0,11932733 9	1,13
120074B-a_42	0	446446	0,0039	80	45	200	0,1164	0,0011	5,661	0,124	0,353	0,007	0,90	102	1901	17	1925	19	1948	34	2,83389232 8	2,04	0,11635595 8	0,97
120074B-a_43	0	132053	0,0130	26	36	59	0,1193	0,0014	5,769	0,132	0,351	0,007	0,86	100	1946	21	1942	20	1938	34	2,85171424 6	2,06	0,11930858 8	1,17
120074B-a_44	0	712156	0,0024	136	177	324	0,1175	0,0009	5,617	0,120	0,347	0,007	0,93	100	1918	14	1919	18	1919	33	2,88323095	2,02	0,11745164 9	0,79
120074B-a_45	0	244239	0,0070	43	20	111	0,1178	0,0014	5,661	0,129	0,349	0,007	0,86	100	1922	21	1925	19	1928	34	2,86819595 7	2,06	0,11775747 8	1,16
120074B-a_46	0	277208	0,0062	54	63	108	0,1369	0,0014	7,643	0,169	0,405	0,008	0,89	100	2188	18	2190	20	2192	38	2,46893722 7	2,05	0,13686472 5	1,02
120074B-a_47	0	928765	0,0019	195	301	356	0,1492	0,0010	8,478	0,177	0,412	0,008	0,95	95	2336	11	2284	19	2225	38	2,42596802 3	2,02	0,14917435 7	0,67
120074B-a_48	0	439848	0,0039	89	168	203	0,1206	0,0009	5,681	0,120	0,342	0,007	0,94	96	1966	13	1928	18	1894	33	2,92811368 5	2,02	0,12064230 8	0,75
120074B-a_49	0	345011	0,0050	76	188	156	0,1153	0,0010	5,565	0,121	0,350	0,007	0,91	103	1885	16	1911	19	1935	34	2,85724242 5	2,03	0,11532652 3	0,91
120074B-a_50	0	149514	0,0115	28	28	67	0,1194	0,0014	5,826	0,133	0,354	0,007	0,86	100	1947	21	1950	20	1954	35	2,82483307 1	2,06	0,11935916 2	1,17
120074B-a_51	0	511658	0,0034	100	143	230	0,1187	0,0010	5,752	0,124	0,351	0,007	0,92	100	1936	15	1939	18	1942	34	2,84503474 5	2,03	0,11868039 3	0,85
120074B-a_52	0	172632	0,0100	37	45	51	0,1895	0,0020	13,979	0,311	0,535	0,011	0,88	101	2738	17	2748	21	2763	46	1,86911807 5	2,07	0,18949955	1,05
120074B-a_53	0	242851	0,0071	47	65	109	0,1182	0,0013	5,721	0,130	0,351	0,007	0,87	101	1929	20	1935	19	1940	34	2,84847222 4	2,05	0,11819927 8	1,13
120074B-a_54	0	244640	0,0070	47	33	85	0,1763	0,0015	11,102	0,237	0,457	0,009	0,92	93	2618	14	2532	20	2426	41	2,18898857 8	2,03	0,17625362 1	0,82
120074B-a_55	0	268799	0,0064	58	76	82	0,1841	0,0016	13,126	0,282	0,517	0,011	0,92	100	2690	14	2689	20	2687	45	1,93367008 7	2,04	0,18408345 6	0,86
120074B-a_56	0	657319	0,0026	128	168	288	0,1203	0,0009	5,973	0,127	0,360	0,007	0,93	101	1960	13	1972	18	1983	34	2,77643476 6	2,02	0,12027338 6	0,76
120074B-a_57	0	1019483	0,0017	198	240	431	0,1220	0,0010	6,289	0,135	0,374	0,008	0,92	103	1985	15	2017	19	2048	35	2,67389961 9	2,03	0,12196318 7	0,84
120074B-a_58	inclusions	600	2,8672	30	30	245	0,1043	0,0018	1,359	0,035	0,094	0,002	0,75	34	1702	31	871	15	582	12	10,5869366 7	2,11	0,10431185	1,70
120074B-a_59	0	265309	0,0065	52	70	132	0,1220	0,0011	5,351	0,116	0,318	0,006	0,91	90	1986	16	1877	18	1780	32	3,14483391	2,03	0,12203769 6	0,90
120074B-a_60	0	356674	0,0048	62	16	156	0,1235	0,0011	6,133	0,132	0,360	0,007	0,92	99	2007	15	1995	19	1983	35	2,77579414 8	2,03	0,12345987 6	0,86
120074B-a_61	0	340097	0,0051	64	64	142	0,1281	0,0012	6,680	0,145	0,378	0,008	0,91	100	2073	16	2070	19	2067	36	2,64490338 5	2,03	0,12813785 3	0,90
120074B-a_62	0	553698	0,0031	99	76	309	0,1170	0,0011	4,568	0,100	0,283	0,006	0,90	84	1910	17	1743	18	1608	29	3,53005917 8	2,03	0,11695469 4	0,93
120074B-a_63	U tripped	538634	0,0032	127	337	217	0,1291	0,0010	6,983	0,149	0,392	0,008	0,93	102	2086	14	2109	19	2134	37	2,54886605 1	2,03	0,12908188 7	0,80
120074B-a_64	0	375518	0,0046	78	118	138	0,1479	0,0011	8,772	0,186	0,430	0,009	0,93	99	2322	13	2315	19	2306	39	2,32509655 2	2,02	0,14792168 8	0,77
120074B-a_65	0	224214	0,0077	43	52	99	0,1188	0,0011	5,891	0,129	0,360	0,007	0,90	102	1938	17	1960	19	1980	35	2,78072965 5	2,04	0,11880270 6	0,96
120074B-a_66	0	255311	0,0067	46	32	170	0,1182	0,0013	3,864	0,086	0,237	0,005	0,88	71	1929	19	1606	18	1371	25	4,21813051	2,04	0,11821553 6	1,07

Appendix 3(8) U-Pb analyses.

120074B-a_67	0	268962	0,0064	52	65	120	0,1189	0,0014	5,814	0,132	0,355	0,007	0,86	101	1940	21	1948	20	1956	35	2,82063667 9	2,06	0,11892872 3	1,15
120074B-a_68	0	593438	0,0029	110	95	248	0,1203	0,0011	6,270	0,136	0,378	0,008	0,91	105	1961	16	2014	19	2067	36	2,64567410 5	2,03	0,12030113 6	0,89
120074B-a_69	0	835527	0,0021	177	347	376	0,1252	0,0008	6,055	0,127	0,351	0,007	0,95	95	2031	12	1984	18	1938	34	2,85058486 5	2,01	0,12519090 7	0,67
120074B-a_70	0	277252	0,0062	50	39	124	0,1178	0,0011	5,746	0,126	0,354	0,007	0,90	102	1922	17	1938	19	1953	34	2,82540256 9	2,04	0,11775237 4	0,95
120074B-a_71	0	184007	0,0094	34	41	92	0,1185	0,0012	5,173	0,115	0,317	0,006	0,88	92	1933	19	1848	19	1773	32	3,15789035 2	2,04	0,11847108 7	1,04
120074B-a_72	0	432392	0,0040	79	69	198	0,1183	0,0013	5,627	0,127	0,345	0,007	0,87	99	1931	20	1920	19	1910	34	2,89894857 2	2,05	0,11830750 3	1,11
120074B-a_73	0	550297	0,0031	102	93	235	0,1216	0,0010	6,208	0,133	0,370	0,008	0,92	103	1980	15	2006	19	2031	35	2,70035456 2	2,03	0,12158594 2	0,84
120074B-a_74	0	78398	0,0220	18	51	36	0,1178	0,0017	5,656	0,138	0,348	0,007	0,80	100	1923	26	1925	21	1926	35	2,87204678 4	2,09	0,11781785 2	1,47
120074B-a_75	short	362903	0,0047	68	51	159	0,1223	0,0015	6,087	0,141	0,361	0,007	0,84	100	1989	22	1988	20	1987	35	2,76936748 4	2,07	0,12226054 5	1,25
120074B-a_76	0	1194275	0,0014	208	69	510	0,1258	0,0009	6,416	0,136	0,370	0,007	0,93	99	2041	13	2034	18	2028	35	2,70452480 3	2,02	0,12584930 4	0,75
120074B-a_77	0	204295	0,0084	36	15	91	0,1180	0,0013	5,746	0,130	0,353	0,007	0,87	101	1926	20	1938	19	1950	34	2,83034571 6	2,05	0,11796174 9	1,14
120074B-a_78	0	177829	0,0097	34	47	80	0,1199	0,0013	5,806	0,131	0,351	0,007	0,87	99	1955	20	1947	19	1940	34	2,84743336 1	2,05	0,11990993 6	1,12
120074B-a_79	0	205943	0,0084	46	65	61	0,1877	0,0020	13,815	0,309	0,534	0,011	0,88	101	2722	17	2737	21	2757	46	1,87353748 8	2,07	0,18772658 1	1,06
120074B-a_80	0	486319	0,0035	110	171	146	0,1910	0,0014	13,871	0,292	0,527	0,011	0,94	99	2751	12	2741	20	2727	45	1,89869015	2,02	0,19101599	0,71
120074B-a_81	0	395068	0,0044	72	57	179	0,1179	0,0010	5,677	0,121	0,349	0,007	0,92	100	1924	15	1928	18	1932	34	2,86234122 7	2,02	0,11785486	0,82
120074B-a_82	0	576270	0,0030	110	125	253	0,1199	0,0011	5,955	0,129	0,360	0,007	0,91	101	1955	16	1969	19	1983	35	2,77597759 4	2,03	0,11989354 1	0,91
120074B-a_83	0	163425	0,0105	35	76	70	0,1242	0,0014	6,347	0,144	0,371	0,008	0,87	101	2018	20	2025	20	2032	36	2,69883663 2	2,05	0,12422894 6	1,13
120074B-a_84	0	2230	0,7720	54	70	123	0,1191	0,0014	5,711	0,129	0,348	0,007	0,87	99	1942	20	1933	19	1924	34	2,87491171 7	2,06	0,11908031 6	1,14
120074B-a_85	short	110274	0,0156	21	21	45	0,1290	0,0026	6,828	0,189	0,384	0,008	0,69	100	2085	35	2089	24	2094	39	2,60534790 6	2,19	0,12901647 9	2,01
120074B-a_86	0	178273	0,0097	33	26	72	0,1303	0,0015	7,001	0,159	0,390	0,008	0,87	101	2101	20	2112	20	2122	37	2,56547137 6	2,06	0,13025798 9	1,13
120074B-a_87	0	263137	0,0065	52	85	117	0,1190	0,0012	5,843	0,130	0,356	0,007	0,89	101	1941	18	1953	19	1964	34	2,80747631	2,04	0,11898129 3	1,02
120074B-a_88	0	523925	0,0033	93	61	229	0,1207	0,0010	6,012	0,129	0,361	0,007	0,92	101	1967	15	1978	18	1988	35	2,76811076 8	2,02	0,12070626 9	0,83
120074B-a_89	0	165296	0,0104	32	42	95	0,1242	0,0013	4,727	0,106	0,276	0,006	0,88	78	2017	19	1772	19	1572	28	3,62225119 5	2,05	0,12419579 4	1,07
120074B-a_90	0	254667	0,0068	48	46	111	0,1215	0,0014	6,088	0,139	0,364	0,007	0,86	101	1978	21	1989	20	1999	35	2,75050066 4	2,06	0,12145264 1	1,16
120074B-a_91	0	246286	0,0070	51	113	113	0,1252	0,0012	5,957	0,130	0,345	0,007	0,90	94	2032	17	1970	19	1911	34	2,89769108 1	2,03	0,12519806	0,94
120074B-a_92	step in ratio	981462	0,0018	179	75	373	0,1580	0,0012	9,068	0,192	0,416	0,008	0,94	92	2434	13	2345	19	2244	38	2,40174531 3	2,02	0,15796103 6	0,75
120074B-a_93	0	115916	0,0149	22	24	53	0,1187	0,0015	5,641	0,132	0,345	0,007	0,84	99	1937	23	1922	20	1909	34	2,90192206 7	2,07	0,11872195	1,28
120074B-a_94	0	463361	0,0037	85	64	206	0,1191	0,0012	5,828	0,129	0,355	0,007	0,89	101	1943	18	1951	19	1958	34	2,81714125 3	2,04	0,11908484 8	1,02
120074B-a_95	0	322140	0,0053	60	59	143	0,1172	0,0012	5,758	0,129	0,356	0,007	0,88	103	1914	19	1940	19	1965	35	2,80581384 3	2,04	0,11717045 8	1,06
120074B-a_96	0	184957	0,0093	39	88	84	0,1181	0,0012	5,636	0,126	0,346	0,007	0,88	99	1928	19	1922	19	1916	34	2,88969242 8	2,04	0,11812446 6	1,05
120074B-a_97	0	140009	0,0123	27	33	62	0,1204	0,0016	5,929	0,140	0,357	0,007	0,83	100	1962	23	1965	20	1969	35	2,79909735 3	2,07	0,12036232 4	1,32
120074B-a_98	0	511612	0,0034	101	156	226	0,1151	0,0009	5,670	0,121	0,357	0,007	0,93	105	1881	14	1927	18	1969	34	2,79866034 7	2,02	0,11509056 9	0,79
120074B-a_99	0	185177	0,0093	34	30	83	0,1190	0,0013	5,769	0,130	0,351	0,007	0,87	100	1942	20	1942	19	1942	34	2,84526815 4	2,05	0,11904438 6	1,11
120074B-a_100	0	4449	0,3869	185	92	314	0,1917	0,0015	12,625	0,269	0,478	0,010	0,93	91	2757	13	2652	20	2517	42	2,09379835 9	2,03	0,19171237 3	0,80
120074B-a_101	0	260880	0,0066	57	89	111	0,1219	0,0013	6,255	0,140	0,372	0,008	0,88	103	1984	19	2012	19	2039	36	2,68748578	2,05	0,12191390 3	1,06
120074B-a_102	0	446201	0,0039	84	81	185	0,1291	0,0012	6,777	0,148	0,381	0,008	0,91	100	2085	16	2083	19	2080	36	2,62592724 2	2,03	0,12907556 4	0,92
120074B-a_103	0	778639	0,0022	143	137	340	0,1160	0,0009	5,796	0,123	0,362	0,007	0,93	105	1896	14	1946	18	1993	35	2,76060376 7	2,02	0,11604297 5	0,78
120074B-a_104	0	645917	0,0027	112	41	291	0,1175	0,0010	5,678	0,122	0,350	0,007	0,92	101	1919	15	1928	18	1936	34	2,85427351 9	2,02	0,11753788 7	0,84
120074B-a_105	0	489054	0,0035	88	61	207	0,1217	0,0011	6,275	0,136	0,374	0,008	0,91	103	1981	16	2015	19	2048	36	2,67374341 2	2,03	0,12168622 7	0,92
120074B-a_106	0	975305	0,0018	170	66	433	0,1189	0,0009	5,835	0,123	0,356	0,007	0,94	101	1940	13	1952	18	1963	34	2,80977461	2,02	0,11890865 6	0,74

Appendix 3(9) U-Pb analyses.

				Pb	Th	U									Derived ages and errors						T-W (Pbc corrected)			
Sample	Comment	Pb206/Pb204	206Pbc(%)	ppm			207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	r	% Concordance	207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	238U/206Pb	1s %	207Pb/206Pb	1s %
120097-1200 94 A_01	0	3423	0,5029	67	52	169	0,1138	0,0004	5,436	0,110	0,346	0,007	0,99	103	1862	6	1891	17	1917	33	2,887609457	2,00	0,113839354	0,33
120097-1200 94 A_02	0	342943	0,0050	62	52	157	0,1170	0,0004	5,562	0,112	0,345	0,007	0,99	100	1911	6	1910	17	1909	33	2,900695492	2,00	0,117013099	0,35
120097-1200 94 A_03	0	714192	0,0024	144	247	312	0,1214	0,0004	6,038	0,122	0,361	0,007	0,99	100	1977	5	1981	17	1986	34	2,771988109	2,00	0,121391696	0,30
120097-1200 94 A_04	0	284365	0,0061	51	33	128	0,1178	0,0004	5,699	0,115	0,351	0,007	0,98	101	1923	7	1931	17	1939	33	2,850275056	2,00	0,117815799	0,37
120097-1200 94 A_05	0	260953	0,0066	49	60	116	0,1227	0,0005	6,009	0,122	0,355	0,007	0,98	98	1996	7	1977	17	1959	34	2,816512617	2,01	0,122743557	0,39
120097-1200 94 A_06	0	513761	0,0034	101	93	164	0,1705	0,0005	11,599	0,233	0,493	0,010	0,99	101	2563	5	2573	19	2585	43	2,027360779	2,00	0,170544018	0,30
120097-1200 94 A_07	0	277536	0,0062	51	49	126	0,1179	0,0005	5,624	0,114	0,346	0,007	0,98	100	1924	8	1920	17	1916	33	2,889923542	2,01	0,117877832	0,44
120097-1200 94 A_08	0	142442	0,0121	27	29	61	0,1186	0,0006	6,068	0,124	0,371	0,007	0,97	105	1935	8	1986	18	2034	35	2,695212928	2,01	0,118611916	0,47
120097-1200 94 A_09	0	260904	0,0066	48	48	116	0,1177	0,0005	5,757	0,117	0,355	0,007	0,98	102	1921	7	1940	17	1958	34	2,818153762	2,01	0,117661153	0,41
120097-1200 94 A_10	0	384907	0,0045	77	109	165	0,1239	0,0006	6,302	0,128	0,369	0,007	0,97	101	2012	8	2019	18	2025	35	2,709973113	2,01	0,123853924	0,45
120097-1200 94 A_11	inclusions	517549	0,0033	91	58	333	0,1187	0,0004	4,015	0,081	0,245	0,005	0,99	73	1936	6	1637	16	1414	25	4,075868848	2,00	0,118683181	0,33
120097-1200 94 A_12	0	199860	0,0086	42	81	82	0,1295	0,0005	6,838	0,139	0,383	0,008	0,98	100	2091	7	2091	18	2090	36	2,611534399	2,01	0,129508522	0,41
120097-120094A_13a	0	274380	0,0063	53	74	123	0,1187	0,0004	5,775	0,117	0,353	0,007	0,98	101	1936	7	1943	17	1949	34	2,833461492	2,01	0,118670249	0,38
120097-120094A_13b	0	298006	0,0058	53	30	133	0,1182	0,0004	5,781	0,117	0,355	0,007	0,99	101	1930	6	1944	17	1956	34	2,820248356	2,00	0,118246117	0,35
120097-1200 94 A_14	0	348960	0,0049	65	72	157	0,1164	0,0004	5,638	0,114	0,351	0,007	0,99	102	1902	6	1922	17	1940	33	2,847448579	2,00	0,116438284	0,34
120097-1200 94 A_15	0	218870	0,0079	43	66	98	0,1190	0,0004	5,781	0,117	0,352	0,007	0,98	100	1942	7	1944	17	1945	34	2,839337899	2,01	0,119048067	0,37
120097-1200 94 A_16	0	402380	0,0043	73	56	179	0,1175	0,0004	5,735	0,116	0,354	0,007	0,99	102	1919	6	1937	17	1954	34	2,824976807	2,00	0,117510821	0,34
120097-1200 94 A_17	0	362977	0,0047	73	55	106	0,1949	0,0007	14,496	0,292	0,539	0,011	0,99	100	2784	5	2783	19	2781	45	1,853579423	2,01	0,194871564	0,33
120097-1200 94 A_18	0	933694	0,0018	182	218	361	0,1420	0,0004	7,983	0,160	0,408	0,008	0,99	98	2252	5	2229	18	2204	37	2,453091298	2,00	0,142035417	0,27
120097-1200 94 A_19	0	301558	0,0057	56	49	137	0,1197	0,0006	5,734	0,117	0,348	0,007	0,97	99	1951	8	1937	17	1923	33	2,877090702	2,01	0,119654315	0,46
120097-1200 94 A_20	0	363213	0,0047	64	39	167	0,1154	0,0004	5,453	0,110	0,343	0,007	0,99	101	1885	6	1893	17	1900	33	2,916817613	2,00	0,115358591	0,33
120097-1200 94 A_21	0	484838	0,0036	104	90	122	0,2381	0,0007	20,532	0,413	0,625	0,013	0,99	101	3108	5	3117	19	3131	49	1,599183192	2,00	0,238138482	0,29
120097-1200 94 A_22	0	2262424	0,0008	461	704	913	0,1267	0,0003	6,832	0,137	0,391	0,008	0,99	104	2052	5	2090	18	2128	36	2,55611982	2,00	0,126664719	0,28
120097-1200 94 A_23	0	323033	0,0053	59	47	147	0,1162	0,0004	5,553	0,112	0,347	0,007	0,98	101	1898	7	1909	17	1918	33	2,884964713	2,01	0,116187556	0,38
120097-1200 94 A_24	0	32262	0,0534	7	10	9	0,2058	0,0017	16,051	0,344	0,566	0,012	0,92	101	2873	14	2880	20	2890	48	1,767651238	2,06	0,205774801	0,84
120097-1200 94 A_25	0	1323039	0,0013	225	30	604	0,1179	0,0004	5,617	0,113	0,346	0,007	0,99	99	1924	6	1919	17	1914	33	2,89326997	2,00	0,117869883	0,31
120097-1200 94 A_26	0	264108	0,0065	49	48	106	0,1306	0,0005	7,065	0,143	0,392	0,008	0,98	101	2106	6	2120	18	2134	36	2,548099521	2,01	0,130569481	0,36
120097-1200 94 A_27	0	450043	0,0038	83	47	171	0,1456	0,0005	8,342	0,168	0,416	0,008	0,99	98	2295	5	2269	18	2240	38	2,406734885	2,00	0,145608074	0,32
120097-1200 94 A_28	0	5785	0,2976	146	319	189	0,1761	0,0005	12,050	0,243	0,496	0,010	0,99	99	2617	5	2608	19	2597	43	2,015367165	2,00	0,176131959	0,31
120097-1200 94 A_29	0	1078573	0,0016	203	193	449	0,1268	0,0004	6,628	0,134	0,379	0,008	0,99	101	2054	6	2063	18	2072	35	2,6375361	2,00	0,126783108	0,34
120097-1200 94 A_30	0	20884	0,0824	428	655	880	0,1254	0,0004	6,537	0,132	0,378	0,008	0,99	102	2034	5	2051	18	2068	35	2,644028106	2,00	0,12535818	0,30
120097-1200 94 A_31	0	185716	0,0093	35	46	84	0,1154	0,0005	5,544	0,113	0,348	0,007	0,98	102	1886	8	1907	17	1927	33	2,869535098	2,01	0,115370756	0,42
120097-1200 94 A_32	0	1922416	0,0009	324	23	887	0,1149	0,0003	5,421	0,109	0,342	0,007	0,99	101	1878	5	1888	17	1898	33	2,921203122	2,00	0,114858878	0,30
120097-1200 94 A_33	0	2282980	0,0008	498	844	767	0,1616	0,0004	10,467	0,210	0,470	0,009	0,99	100	2473	5	2477	18	2482	41	2,128809908	2,00	0,161613788	0,27
120097-1200 94 A_34	0	408738	0,0042	73	48	186	0,1180	0,0004	5,647	0,114	0,347	0,007	0,98	100	1927	6	1923	17	1920	33	2,881935467	2,00	0,118028014	0,36
120097-1200 94 A_35	0	551038	0,0031	110	149	215	0,1338	0,0005	7,464	0,151	0,405	0,008	0,98	102	2148	6	2169	18	2190	37	2,471659176	2,01	0,133796769	0,36
120097-1200 94 A_36	0	331833	0,0052	66	105	143	0,1233	0,0005	6,209	0,126	0,365	0,007	0,98	100	2005	7	2006	18	2006	34	2,738797984	2,01	0,123326593	0,38
120097-1200 94 A_37	0	1654151	0,0010	365	476	466	0,1966	0,0005	15,205	0,305	0,561	0,011	0,99	103	2798	4	2828	19	2871	46	1,782695315	2,00	0,196596385	0,27
120097-1200 94 A_38	0	284747	0,0060	57	95	122	0,1246	0,0004	6,325	0,128	0,368	0,007	0,98	100	2023	6	2022	18	2021	35	2,716388953	2,00	0,124600428	0,35
120097-1200 94 A_39	0	942458	0,0018	168	103	434	0,1177	0,0004	5,569	0,112	0,343	0,007	0,99	99	1921	6	1911	17	1902	33	2,913013635	2,00	0,117650682	0,32
120097-1200 94 A_40	0	354324	0,0049	64	52	161	0,1171	0,0004	5,613	0,114	0,348	0,007	0,98	100	1913	7	1918	17	1923	33	2,877677322	2,01	0,117148175	0,38
120097-1200 94 A_41	0	530535	0,0032	97	88	246	0,1151	0,0004	5,398	0,109	0,340	0,007	0,99	100	1882	6	1884	17	1887	33	2,941238838	2,00	0,115139541	0,32
120097-1200 94 A_42	inclusions	1140752	0,0015	207	101	410	0,1378	0,0004	8,342	0,168	0,439	0,009	0,99	107	2199	5	2269	18	2347	39	2,277140969	2,00	0,137776188	0,27
120097-1200 94 A_43	0	854047	0,0020	177	330	356	0,1242	0,0004	6,495	0,131	0,379	0,008	0,99	103	2017	5	2045	18	2073	35	2,636302003	2,00	0,12418848	0,30
120097-1200 94 A_44	0	433620	0,0040	88	96	144	0,1749	0,0005	11,489	0,231	0,476	0,010	0,99	96	2605	5	2564	19	2512	42	2,099014193	2,00	0,174902152	0,29
120097-1200 94 A_45	0	654974	0,0026	121	117	296	0,1186	0,0004	5,707	0,115	0,349	0,007	0,99	100	1935	6	1932	17	1930	33	2,864851521	2,00	0,118579114	0,31
120097-1200 94 A_46	short	558228	0,0031	100	67	254	0,1180	0,0005	5,654	0,115	0,348	0,007	0,98	100	1926	7	1924	17	1923	33	2,87700011	2,01	0,117972556	0,40
120097-1200 94 A_47	0	348397	0,0049	61	39	201	0,1185	0,0004	4,483	0,090	0,274	0,005	0,99	81	1934	6	1728	17	1563	28	3,645370918	2,00	0,118534264	0,34
120097-1200 94 A_48	0	296782	0,0058	55	61	137	0,1183	0,0004	5,582	0,113	0,342	0,007	0,99	98	1931	6	1913	17	1897	33	2,923376333	2,00	0,118344408	0,33
120097-1200 94 A_49	inclusions	437826	0,0039	84	61	151	0,1647	0,0006	10,419	0,211	0,459	0,009	0,98	97	2505	6	2473	19	2434	41	2,180102729	2,01	0,164738691	0,38
120097-1200 94 A_50	0	319442	0,0054	62	93	140	0,1201	0,0004	5,985	0,121	0,361	0,007	0,98	102	1958	6	1974	17	1989	34	2,766623534	2,00	0,120095787	0,36
120097-1200 94 A_51	0	920515	0,0019	182	264	385	0,1259	0,0004	6,562	0,132	0,378	0,008	0,99	101	2042	5	2054	18	2067	35	2,645788217	2,00	0,12592406	0,31
120097-1200 94 A_52	0	296958	0,0058	55	56	186	0,1161	0,0004	4,048	0,082	0,253	0,005	0,99	77	1897	6	1644	16	1453	26	3,954877333	2,00	0,116111584	0,33
120097-1200 94 A_53	0	223530	0,0077	43	53	105	0,1168	0,0004	5,422	0,110	0,337	0,007	0,98	98	1907	6	1888	17	1871	32	2,969361168	2,00	0,116764243	0,35
120097-1200 94 A_54	0	432097	0,0040	78	53	210	0,1194	0,0005	5,358	0,109	0,325	0,007	0,98	93	1947	7	1878	17	1816	32	3,073110885	2,01	0,119415699	0,42
120097-1200 94 A_55	0	202785	0,0085	39	48	80	0,1312	0,0005	7,238	0,147	0,400	0,008	0,98	103	2114	7	2141	18	2170	37	2,498400124	2,01	0,131159357	0,40
120097-1200 94 A_56	short	2359891	0,0007	446	527	1104	0,1144	0,0004	5,330	0,107	0,338	0,007	0,99	100	1871	6	1874	17	1876	33	2,960102302	2,00	0,114434014	0,32
120097-1200 94 A_57	inclusions	551305	0,0031	108	94	194	0,1676	0,0005	10,355	0,208	0,448	0,009	0,99	94	2534	5	2467	18	2386	40	2,232020283	2,00	0,167628798	0,31
120097-1200 94 A_58	0	924921	0,0019	177	84	281	0,1988	0,0006	14,262	0,287	0,520	0,010	0,99	96	2817	5	2767	19	2700	44	1,92235008	2,00	0,198843834	0,28
120097-1200 94 A_59	short	298174	0,0058	68	101	90	0,1851	0,0008	13,372	0,273	0,524	0,011	0,97	101	2699	8	2706	19	2716	44	1,908518365	2,01	0,185096256	0,46
120097-1200 94 A_60	0	562299	0,0031	103	91	256	0,1167	0,0004	5,581	0,112	0,347	0,007	0,99	101	1906	6	1913	17	1920	33	2,88266134	2,00	0,116677157	0,31
120097-1200 94 A_61	0	895439	0,0019	175	242	382	0,1253	0,0004	6,396	0,129	0,370	0,007	0,99	100	2033	6	2032	18	2030	35	2,70103908	2,00	0,125305894	0,31
120097-1200 94 A_62	0	320550	0,0054	68	85	95	0,1932	0,0006	14,187	0,286	0,533	0,011	0,99	99	2770	5	2762	19	2752	45	1,877623239	2,00	0,193191297	0,33
120097-1200 94 A_63	0	2264	0,7602	44	46	105	0,1127	0,0005	5,551	0,113	0,357	0,007	0,97	107	1844	8	1908	17	1968	34	2,800416441	2,01	0,112735958	0,45
120097-1200 94 A_64	0	484827	0,0036	96	149	218	0,1196	0,0004	5,806	0,117	0,352	0,007	0,99	100	1950	5	1947	17	1945	34	2,839650255	2,00	0,119579767	0,31
120097-1200 94 A_65	0	430121	0,0040	76	37	195	0,1168	0,0004	5,631	0,113	0,350	0,007	0,99	101	1908	6	1921	17	1933	33	2,860725	2,00	0,116824944	0,33
120097-1200 94 A_66	inclusions	548405	0,0031	105	101	212	0,1459	0,0004	8,222	0,165	0,409	0,008	0,99	96	2298	5	2256	18	2210	37	2,445931184	2,00	0,145860036	0,30
120097-1200 94 A_67	0	154452	0,0111	31	50	63	0,1302	0,0006	6,967	0,142	0,388	0,008	0,98	101	2101	8	2107	18	2114	36	2,577363054	2,01	0,130232954	0,44
120097-1200 94 A_68	0	206149	0,0084	39	55	93	0,1192	0,0004	5,776	0,117	0,351	0,007	0,98	100	1944	6	1943	17	1942	34	2,845078201	2,00	0,119185361	0,36
120097-1200 94 A_69	0	197262	0,0087	37	38	88	0,1188	0,0005	5,786	0,117	0,353	0,007	0,98	101	1938	7	1944	17	1950	34	2,831134683	2,01	0,118805847	0,41
120097-1200 94 A_70	0	936006	0,0018	175	186	418	0,1204	0,0004	5,877	0,118	0,354	0,007	0,99	100	1963	6	1958	17	1953	34	2,825457301	2,00	0,120441409	0,31
120097-1200 94 A_71	0	360673	0,0048	74	144	161	0,1224	0,0004	5,966	0,121	0,353	0,007	0,98	98	1991	6	1971	17	1951	34	2,828975674	2,00	0,122399175	0,36
120097-1200 94 A_72	0	292521	0,0059	54	50	132	0,1174	0,0004	5,689	0,115	0,351	0,007	0,98	101	1917	7	1930	17	1941	34	2,845765924	2,01	0,11742522	0,38

Appendix 3(10) U-Pb analyses.

120097-1200 94 A _ 73	0	829161	0,0021	149	106	370	0,1184	0,0004	5,787	0,117	0,354	0,007	0,99	101	1933	6	1944	17	1955	34	2,822026668	2,00	0,118440133	0,33
120097-1200 94 A _ 74	0	1078561	0,0016	210	318	496	0,1171	0,0003	5,555	0,112	0,344	0,007	0,99	100	1912	5	1909	17	1906	33	2,905929633	2,00	0,1170761	0,29
120097-1200 94 A _ 75	0	243601	0,0071	54	76	73	0,1864	0,0007	13,542	0,274	0,527	0,011	0,98	101	2710	6	2718	19	2729	44	1,897349709	2,01	0,186354111	0,36
120097-1200 94 A _ 76	0	547468	0,0031	108	165	238	0,1221	0,0004	6,127	0,124	0,364	0,007	0,99	101	1987	6	1994	17	2001	34	2,747311671	2,00	0,122092634	0,33
120097-1200 94 A _ 77	0	546806	0,0031	116	210	225	0,1312	0,0004	6,947	0,140	0,384	0,008	0,99	99	2115	5	2105	18	2095	36	2,604723472	2,00	0,131238957	0,31
120097-1200 94 A _ 78	0	387008	0,0044	71	63	163	0,1257	0,0005	6,527	0,132	0,377	0,008	0,98	101	2039	7	2050	18	2060	35	2,655727561	2,01	0,125711542	0,40
120097-1200 94 A _ 79	0	226676	0,0076	41	33	101	0,1188	0,0005	5,799	0,117	0,354	0,007	0,98	101	1939	7	1946	17	1953	34	2,825371044	2,01	0,118838888	0,38
120097-1200 94 A _ 80	0	1500759	0,0011	276	236	646	0,1276	0,0004	6,468	0,130	0,368	0,007	0,99	98	2065	5	2042	18	2018	35	2,720097658	2,00	0,127605136	0,29
120097-1200 94 A _ 81	end of run	106850	0,0161	21	16	31	0,1921	0,0013	14,280	0,300	0,539	0,011	0,94	101	2761	11	2769	20	2779	46	1,855168122	2,04	0,19214297	0,70
120097-1200 94 A _ 82	0	156289	0,0110	29	32	72	0,1167	0,0005	5,562	0,113	0,346	0,007	0,98	100	1906	8	1910	17	1914	33	2,893132507	2,01	0,116709199	0,44
120097-1200 94 A _ 83	inclusions	163532	0,0105	31	28	86	0,1526	0,0008	6,336	0,130	0,301	0,006	0,97	71	2375	9	2023	18	1697	30	3,320573382	2,01	0,152588603	0,51
120097-1200 94 A _ 84	0	936573	0,0018	172	145	419	0,1189	0,0004	5,796	0,117	0,353	0,007	0,99	101	1940	6	1946	17	1951	34	2,829284649	2,00	0,118928278	0,32
120097-1200 94 A _ 85	0	461827	0,0037	90	56	140	0,1877	0,0006	13,490	0,272	0,521	0,010	0,99	99	2722	5	2715	19	2704	44	1,918708545	2,00	0,187720911	0,31
120097-1200 94 A _ 86	0	178842	0,0096	38	83	79	0,1219	0,0005	6,053	0,122	0,360	0,007	0,98	100	1984	7	1983	17	1983	34	2,776921867	2,01	0,121898761	0,38
120097-1200 94 A _ 87	0	268456	0,0064	48	29	120	0,1184	0,0004	5,783	0,117	0,354	0,007	0,98	101	1932	7	1944	17	1955	34	2,822927662	2,00	0,118396242	0,36
120097-1200 94 A _ 88	0	392539	0,0044	75	78	153	0,1358	0,0005	7,574	0,153	0,405	0,008	0,99	101	2174	6	2182	18	2190	37	2,471277415	2,00	0,135750654	0,33
120097-1200 94 A _ 89	0	1493200	0,0012	317	706	626	0,1281	0,0004	6,666	0,134	0,377	0,008	0,99	100	2072	5	2068	18	2064	35	2,649741558	2,00	0,128106638	0,29
120097-1200 94 A _ 90	0	69271	0,0249	12	8	31	0,1182	0,0006	5,673	0,117	0,348	0,007	0,96	100	1929	10	1927	18	1925	33	2,873333602	2,01	0,11821901	0,55
120097-1200 94 A _ 91	0	4041	0,4260	100	122	207	0,1278	0,0004	6,893	0,139	0,391	0,008	0,99	103	2068	6	2098	18	2129	36	2,555913547	2,00	0,127785364	0,34
120097-1200 94 A _ 92	0	582826	0,0030	108	115	295	0,1157	0,0004	4,985	0,100	0,313	0,006	0,99	93	1890	6	1817	17	1753	31	3,199336282	2,00	0,115668136	0,33
120097-1200 94 A _ 93	0	299314	0,0058	53	28	133	0,1205	0,0004	5,910	0,119	0,356	0,007	0,99	100	1963	6	1963	17	1962	34	2,810847543	2,00	0,120475603	0,34
120097-1200 94 A _ 94	0	914921	0,0019	205	544	413	0,1175	0,0004	5,685	0,115	0,351	0,007	0,99	101	1918	6	1929	17	1939	33	2,848985157	2,00	0,117477619	0,32
120097-1200 94 A _ 95	0	4414	0,3900	86	118	211	0,1145	0,0004	5,459	0,110	0,346	0,007	0,99	102	1872	6	1894	17	1915	33	2,891406683	2,00	0,114475122	0,35
120097-1200 94 A _ 96	0	4995	0,3447	95	172	218	0,1151	0,0004	5,439	0,110	0,343	0,007	0,99	101	1881	6	1891	17	1901	33	2,916399848	2,00	0,115051451	0,34
120097-1200 94 A _ 97	0	215409	0,0080	42	66	100	0,1170	0,0005	5,509	0,112	0,341	0,007	0,98	99	1911	7	1902	17	1894	33	2,928768455	2,01	0,117024848	0,40
120097-1200 94 A _ 98	0	310445	0,0055	60	82	140	0,1181	0,0004	5,732	0,116	0,352	0,007	0,98	101	1928	7	1936	17	1944	34	2,841514464	2,01	0,118129764	0,38
120097-1200 94 A _ 99	0	710206	0,0024	131	125	307	0,1231	0,0004	6,222	0,125	0,366	0,007	0,99	101	2002	5	2008	17	2013	35	2,728776533	2,00	0,123137877	0,31
120097-120094A_ 100	0	1063693	0,0016	180	14	469	0,1182	0,0004	5,850	0,118	0,359	0,007	0,98	102	1930	7	1954	17	1977	34	2,786733666	2,00	0,118235766	0,37
120097-120094A_ 101	short	558153	0,0031	100	61	256	0,1225	0,0005	5,837	0,118	0,346	0,007	0,98	96	1992	7	1952	17	1914	33	2,89228445	2,01	0,122450902	0,39
120097-120094A_ 102	0	404448	0,0043	84	170	185	0,1181	0,0004	5,642	0,114	0,347	0,007	0,99	100	1928	6	1923	17	1918	33	2,885792809	2,00	0,118092749	0,35
120097-120094A_ 103	0	131263	0,0131	25	28	62	0,1265	0,0005	5,802	0,118	0,333	0,007	0,98	90	2050	7	1947	17	1851	32	3,005789994	2,01	0,126492281	0,42
120097-120094A_ 104	0	382323	0,0045	87	139	115	0,1895	0,0006	13,775	0,278	0,527	0,011	0,99	100	2738	5	2734	19	2730	44	1,896760769	2,00	0,189497722	0,33
120097-120094A_ 105	0	1210	1,4232	20	13	28	0,1935	0,0009	14,859	0,302	0,557	0,011	0,98	103	2772	7	2806	19	2854	46	1,79569089	2,01	0,193515113	0,44
120097-120094A_ 106	0	360743	0,0048	68	72	158	0,1186	0,0005	5,903	0,120	0,361	0,007	0,98	103	1936	7	1962	17	1986	34	2,771544527	2,01	0,118648088	0,39

Appendix 3(11) U-Pb analyses.

				Pb	Th	U									Derived ages and errors						T-W (Pbc corrected)			
Sample	Comment	Pb206/Pb204	206Pbc(%)	ppm			207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	r	% Concordance	207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	238U/206Pb	1s %	207Pb/206Pb	1s %
120098A_01	0	392532	0,0044	115	93	189	0,1695	0,0005	11,323	0,228	0,484	0,010	0,99	100	2553	5	2550	19	2546	42	2,064473247	2,00	0,169543163	0,30
120098A_02	0	286475	0,0060	86	72	128	0,1889	0,0006	13,637	0,275	0,524	0,010	0,99	99	2733	5	2725	19	2714	44	1,909945772	2,00	0,188897888	0,33
120098A_03	0	205660	0,0084	57	54	132	0,1226	0,0006	6,149	0,126	0,364	0,007	0,97	100	1994	9	1997	18	2000	34	2,748637627	2,01	0,122582075	0,48
120098A_04	0	155852	0,0110	44	58	106	0,1174	0,0005	5,543	0,113	0,342	0,007	0,98	99	1917	8	1907	17	1898	33	2,92046255	2,01	0,117414172	0,43
120098A_05	inclusions	783018	0,0022	205	56	489	0,1284	0,0004	6,614	0,133	0,374	0,007	0,99	99	2076	5	2061	18	2047	35	2,675683515	2,00	0,128350406	0,31
120098A_06	0	67697	0,0254	21	46	44	0,1224	0,0008	6,062	0,126	0,359	0,007	0,95	99	1991	11	1985	18	1979	34	2,783707761	2,02	0,12239013	0,64
120098A_07	0	162793	0,0106	47	75	132	0,1162	0,0005	4,628	0,094	0,289	0,006	0,98	86	1898	7	1754	17	1636	29	3,460980338	2,01	0,116181615	0,40
120098A_08	0	350523	0,0049	96	77	225	0,1229	0,0004	6,155	0,124	0,363	0,007	0,98	100	1998	6	1998	17	1998	34	2,75255183	2,00	0,12288157	0,35
120098A_09	0	413069	0,0042	110	65	279	0,1168	0,0004	5,569	0,112	0,346	0,007	0,99	100	1909	6	1911	17	1914	33	2,893110268	2,00	0,116847805	0,35
120098A_10	0	303610	0,0057	84	87	207	0,1165	0,0004	5,519	0,112	0,344	0,007	0,98	100	1903	7	1904	17	1904	33	2,911006	2,01	0,116515261	0,38
120098A_11	0	87149	0,0198	27	48	56	0,1233	0,0008	6,226	0,129	0,366	0,007	0,95	100	2005	11	2008	18	2011	35	2,730772415	2,02	0,123312866	0,63
120098A_12	0	2954	0,5828	89	55	359	0,1043	0,0004	3,052	0,062	0,212	0,004	0,98	73	1701	7	1421	15	1241	23	4,710917163	2,01	0,104262867	0,40
120098A_13	0	202740	0,0085	83	366	144	0,1209	0,0005	5,493	0,112	0,329	0,007	0,98	93	1970	8	1899	17	1836	32	3,03498434	2,01	0,120905987	0,43
120098A_14	0	154328	0,0112	44	55	105	0,1160	0,0006	5,474	0,112	0,342	0,007	0,97	100	1896	9	1897	17	1897	33	2,922248174	2,01	0,116015062	0,48
120098A_15	common Pb	8646	0,1991	124	186	227	0,1264	0,0004	7,265	0,146	0,417	0,008	0,99	110	2048	6	2144	18	2246	38	2,398558651	2,00	0,126376396	0,31
120098A_16	0	571190	0,0030	154	116	385	0,1166	0,0004	5,580	0,113	0,347	0,007	0,98	101	1905	6	1913	17	1920	33	2,882132729	2,00	0,116645128	0,35
120098A_17	0	1079	1,5953	37	48	114	0,1120	0,0005	4,028	0,082	0,261	0,005	0,97	82	1832	9	1640	16	1494	27	3,833270655	2,01	0,1119743	0,48
120098A_18	0	173032	0,0099	48	51	122	0,1158	0,0004	5,310	0,107	0,332	0,007	0,98	98	1893	7	1871	17	1850	32	3,00766822	2,01	0,115837479	0,38
120098A_19	0	386750	0,0045	112	150	252	0,1212	0,0005	5,999	0,122	0,359	0,007	0,98	100	1974	7	1976	18	1977	34	2,785619849	2,01	0,121196291	0,42
120098A_20	0	363662	0,0047	117	264	237	0,1205	0,0004	5,959	0,120	0,359	0,007	0,99	101	1963	6	1970	17	1976	34	2,787949895	2,00	0,120485321	0,32
120098A_21	inclusions	274859	0,0063	71	23	224	0,1153	0,0004	4,555	0,092	0,287	0,006	0,98	86	1884	7	1741	17	1625	29	3,489139637	2,01	0,115256052	0,37
120098A_22	0	1120637	0,0015	293	118	741	0,1168	0,0004	5,698	0,115	0,354	0,007	0,99	102	1908	6	1931	17	1953	34	2,825675787	2,00	0,116780413	0,31
120098A_23	0	283813	0,0061	89	158	174	0,1229	0,0006	6,455	0,132	0,381	0,008	0,97	104	1998	8	2040	18	2081	36	2,624417106	2,01	0,12285793	0,46
120098A_24	0	255618	0,0067	78	120	154	0,1312	0,0005	7,020	0,143	0,388	0,008	0,98	100	2114	7	2114	18	2114	36	2,576583322	2,01	0,131179568	0,42
120098A_25	0	256146	0,0067	72	86	174	0,1169	0,0004	5,569	0,112	0,346	0,007	0,98	100	1909	6	1911	17	1913	33	2,893955555	2,00	0,11688382	0,35
120098A_26	0	185137	0,0093	52	56	141	0,1159	0,0004	4,894	0,099	0,306	0,006	0,98	91	1893	7	1801	17	1723	30	3,264638821	2,01	0,115866459	0,37
~~120098A_27~~	~~Bad run~~	~~2728~~	~~0,6310~~	~~294~~	~~183~~	~~3263~~	~~0,0730~~	~~0,0002~~	~~0,839~~	~~0,017~~	~~0,083~~	~~0,002~~	~~0,99~~	~~51~~	~~1015~~	~~7~~	~~618~~	~~9~~	~~516~~	~~10~~	~~12,00971481~~	~~2,00~~	~~0,07301838~~	~~0,32~~
120098A_28	0	238688	0,0072	71	100	146	0,1358	0,0005	7,170	0,145	0,383	0,008	0,99	96	2174	6	2133	18	2090	36	2,610669515	2,00	0,135757651	0,34
120098A_29a	0	292465	0,0059	101	199	158	0,1573	0,0005	9,409	0,190	0,434	0,009	0,99	96	2427	5	2379	18	2322	39	2,305748158	2,00	0,157343705	0,32
120098A_29b	0	632331	0,0027	159	3	422	0,1172	0,0004	5,662	0,114	0,351	0,007	0,98	101	1913	6	1926	17	1937	33	2,852870008	2,00	0,117161029	0,36
120098A_30	0	1059046	0,0016	340	752	677	0,1224	0,0004	6,186	0,124	0,366	0,007	0,99	101	1992	5	2002	17	2012	35	2,72919396	2,00	0,122448095	0,30
120098A_31	0	459572	0,0037	132	162	336	0,1164	0,0004	5,140	0,104	0,320	0,006	0,98	94	1901	6	1843	17	1791	31	3,121505753	2,00	0,116362588	0,35
120098A_32	0	251192	0,0069	81	173	151	0,1313	0,0006	7,031	0,143	0,388	0,008	0,98	100	2115	7	2115	18	2116	36	2,574421653	2,01	0,131279757	0,42
120098A_33	0	408495	0,0042	132	154	215	0,1842	0,0006	11,310	0,228	0,445	0,009	0,99	88	2691	5	2549	19	2375	40	2,245013615	2,00	0,184152872	0,32
120098A_34	0	141148	0,0122	40	49	100	0,1165	0,0005	5,312	0,108	0,331	0,007	0,98	97	1903	7	1871	17	1842	32	3,023603774	2,01	0,116485201	0,42
120098A_35	0	286964	0,0060	79	77	193	0,1177	0,0004	5,660	0,114	0,349	0,007	0,98	100	1922	6	1925	17	1929	33	2,867577534	2,00	0,117723501	0,35
120098A_36	0	202217	0,0085	56	50	132	0,1204	0,0005	5,977	0,121	0,360	0,007	0,98	101	1963	8	1972	18	1982	34	2,778359139	2,01	0,120433603	0,42
120098A_37	0	612886	0,0028	155	8	419	0,1162	0,0004	5,502	0,111	0,343	0,007	0,99	100	1899	6	1901	17	1903	33	2,912798764	2,00	0,116232737	0,32
120098A_38	short	807629	0,0021	234	325	520	0,1213	0,0005	6,086	0,124	0,364	0,007	0,98	101	1976	8	1988	18	2001	34	2,748147655	2,01	0,121308548	0,43
120098A_39	short	230484	0,0075	60	23	167	0,1173	0,0006	5,231	0,108	0,323	0,007	0,96	94	1916	10	1858	17	1806	32	3,091782142	2,01	0,117303261	0,55
120098A_40	0	305506	0,0056	83	66	204	0,1184	0,0005	5,720	0,116	0,350	0,007	0,98	100	1932	8	1934	17	1936	33	2,853907395	2,01	0,118400702	0,43
120098A_41	0	154711	0,0111	43	39	116	0,1157	0,0005	4,973	0,101	0,312	0,006	0,98	93	1890	8	1815	17	1750	31	3,207255909	2,01	0,115671126	0,44
120098A_42a	0	887005	0,0019	242	154	525	0,1343	0,0004	7,343	0,148	0,397	0,008	0,99	100	2155	5	2154	18	2153	37	2,521608823	2,00	0,134296352	0,30
120098A_42b	0	541644	0,0032	150	110	310	0,1346	0,0004	7,605	0,153	0,410	0,008	0,99	103	2159	5	2185	18	2214	37	2,440212709	2,00	0,134600604	0,31
120098A_43	0	548833	0,0031	166	247	321	0,1553	0,0005	8,590	0,173	0,401	0,008	0,99	90	2405	5	2296	18	2174	37	2,492609798	2,00	0,155299456	0,31
120098A_44	0	306810	0,0056	89	120	315	0,1135	0,0005	3,570	0,072	0,228	0,005	0,98	71	1856	7	1543	16	1325	24	4,382449983	2,01	0,113464327	0,41
120098A_45	0	359909	0,0048	103	131	246	0,1163	0,0005	5,506	0,112	0,343	0,007	0,98	100	1900	8	1902	17	1903	33	2,912726715	2,01	0,116317171	0,42
120098A_46	0	435217	0,0040	127	177	275	0,1257	0,0004	6,436	0,130	0,371	0,007	0,99	100	2039	6	2037	18	2035	35	2,69363413	2,00	0,125728113	0,33
120098A_47	inclusions	7228	0,2382	164	62	326	0,1648	0,0005	9,682	0,195	0,426	0,009	0,99	91	2506	5	2405	18	2288	38	2,347514323	2,00	0,164846179	0,30
120098A_48	0	244621	0,0070	64	30	161	0,1173	0,0005	5,748	0,117	0,356	0,007	0,98	102	1915	8	1939	17	1961	34	2,812565915	2,01	0,117253936	0,42
120098A_49	0	587675	0,0029	178	299	413	0,1189	0,0004	5,478	0,110	0,334	0,007	0,99	96	1940	6	1897	17	1858	32	2,99347501	2,00	0,118920991	0,33
120098A_50	0	135710	0,0127	44	56	60	0,1911	0,0008	14,048	0,285	0,533	0,011	0,98	100	2752	7	2753	19	2754	45	1,875856266	2,01	0,19112164	0,42
120098A_51	0	487600	0,0035	142	196	326	0,1245	0,0004	6,036	0,122	0,352	0,007	0,99	96	2022	5	1981	17	1942	34	2,844168564	2,00	0,124510534	0,31
120098A_52	0	317127	0,0054	82	20	205	0,1230	0,0004	6,172	0,125	0,364	0,007	0,98	100	2000	6	2001	17	2001	34	2,747001311	2,00	0,1229685	0,35
120098A_53	0	883289	0,0019	268	255	413	0,1816	0,0005	12,570	0,253	0,502	0,010	0,99	98	2667	5	2648	19	2623	43	1,991593025	2,00	0,181568651	0,28
120098A_54	0	1469	1,1717	36	48	82	0,1095	0,0006	5,254	0,108	0,348	0,007	0,97	107	1792	9	1861	17	1924	33	2,87467718	2,01	0,109543493	0,50
120098A_55	0	62506	0,0275	19	34	43	0,1167	0,0007	5,510	0,114	0,342	0,007	0,96	100	1906	11	1902	18	1899	33	2,919946569	2,01	0,116685719	0,59
120098A_56	0	542930	0,0032	148	118	353	0,1226	0,0004	6,105	0,123	0,361	0,007	0,99	100	1994	5	1991	17	1988	34	2,768119543	2,00	0,122568226	0,31
120098A_57	0	377655	0,0046	113	159	333	0,1158	0,0004	4,248	0,086	0,266	0,005	0,99	80	1892	6	1683	16	1521	27	3,757199682	2,00	0,11576924	0,34
120098A_58	0	224511	0,0077	59	23	221	0,1165	0,0004	3,832	0,077	0,239	0,005	0,98	73	1903	7	1600	16	1380	25	4,19037274	2,00	0,116469361	0,37
120098A_59	0	203805	0,0084	61	96	135	0,1207	0,0005	5,918	0,120	0,356	0,007	0,98	100	1966	8	1964	18	1961	34	2,811941245	2,01	0,120684441	0,43
120098A_60	0	514826	0,0033	136	61	348	0,1182	0,0004	5,672	0,114	0,348	0,007	0,99	100	1930	6	1927	17	1925	33	2,874227863	2,00	0,118227798	0,34
120098A_61	0	460166	0,0037	130	154	294	0,1221	0,0004	6,192	0,125	0,368	0,007	0,98	102	1987	6	2003	18	2019	35	2,718286947	2,01	0,122065388	0,37
120098A_62	0	244583	0,0070	68	67	155	0,1204	0,0006	6,166	0,126	0,371	0,007	0,97	104	1962	9	2000	18	2036	35	2,691904916	2,01	0,120389477	0,49
120098A_63	0	981013	0,0018	266	171	618	0,1256	0,0004	6,465	0,130	0,373	0,007	0,99	100	2038	6	2041	18	2045	35	2,679350698	2,00	0,125639744	0,31
120098A_64	0	392990	0,0044	104	57	266	0,1163	0,0004	5,562	0,113	0,347	0,007	0,98	101	1900	7	1910	17	1919	33	2,883299481	2,01	0,116314347	0,38
120098A_65	0	495512	0,0035	137	102	333	0,1188	0,0004	5,740	0,116	0,350	0,007	0,99	100	1939	6	1937	17	1936	33	2,854879875	2,00	0,118846505	0,34

Appendix 3(12) U-Pb analyses.

120098A_66	0	209467	0,0082	59	124	163	0,1180	0,0004	4,906	0,099	0,302	0,006	0,98	88	1926	7	1803	17	1699	30	3,31536964 9	2,00	0,11796344 2	0,37
120098A_67	0	418605	0,0041	120	61	209	0,1827	0,0006	11,855	0,239	0,471	0,009	0,99	93	2678	5	2593	19	2486	41	2,12525846 3	2,00	0,18272975 9	0,31
120098A_68	0	158633	0,0109	45	41	96	0,1325	0,0005	7,133	0,144	0,391	0,008	0,98	100	2131	7	2128	18	2125	36	2,56061828	2,01	0,13246398 8	0,38
120098A_69	0	105621	0,0163	34	33	43	0,2131	0,0009	16,910	0,343	0,575	0,012	0,98	100	2930	6	2930	19	2930	47	1,73781657 8	2,01	0,21313592 7	0,40
120098A_70	0	144917	0,0119	41	48	97	0,1187	0,0005	5,731	0,117	0,350	0,007	0,98	100	1936	8	1936	17	1936	33	2,85452910 1	2,01	0,1186588	0,44
120098A_71	0	139802	0,0123	39	43	93	0,1199	0,0005	5,824	0,118	0,352	0,007	0,98	100	1955	7	1950	17	1946	34	2,83854369 8	2,01	0,11989767	0,41
120098A_72	0	345924	0,0050	92	56	235	0,1174	0,0004	5,617	0,114	0,347	0,007	0,98	100	1918	6	1919	17	1920	33	2,88279654 3	2,00	0,1174354	0,36
120098A_73	0	116636	0,0148	36	64	77	0,1228	0,0006	6,033	0,123	0,356	0,007	0,97	98	1998	8	1981	18	1964	34	2,80754717 9	2,01	0,12283722 4	0,47
120098A_74	0	187228	0,0092	50	61	130	0,1188	0,0004	5,577	0,113	0,340	0,007	0,98	97	1939	7	1912	17	1888	33	2,93830327 3	2,01	0,11883931 8	0,38
120098A_75	0	190964	0,0090	58	46	84	0,1999	0,0007	14,818	0,299	0,538	0,011	0,98	98	2825	6	2804	19	2773	45	1,86009732	2,01	0,19990482 9	0,36
120098A_76	0	662927	0,0026	210	412	480	0,1199	0,0004	5,380	0,108	0,325	0,007	0,99	93	1955	5	1882	17	1816	32	3,07327426 3	2,00	0,11991351 8	0,30
120098A_77	0	199816	0,0086	56	60	148	0,1175	0,0004	5,146	0,104	0,318	0,006	0,98	93	1919	7	1844	17	1778	31	3,14917954 1	2,01	0,11753240 6	0,37
120098A_78	0	764394	0,0023	205	123	481	0,1244	0,0004	6,424	0,130	0,375	0,008	0,99	102	2020	6	2036	18	2051	35	2,66987006 8	2,00	0,12440210 8	0,33
120098A_79	0	361200	0,0048	104	132	255	0,1199	0,0004	5,520	0,111	0,334	0,007	0,98	95	1954	6	1904	17	1858	32	2,99343657 5	2,00	0,11985150 7	0,35
120098A_80	short	127426	0,0135	35	33	84	0,1200	0,0008	5,878	0,123	0,355	0,007	0,95	100	1956	12	1958	18	1960	34	2,81492954 3	2,02	0,12000117 6	0,69
120098A_81	0	198856	0,0087	54	46	135	0,1179	0,0005	5,659	0,115	0,348	0,007	0,98	100	1925	7	1925	17	1925	33	2,87281724 4	2,01	0,11790074 6	0,38
120098A_82	0	331779	0,0052	91	15	153	0,1796	0,0007	12,639	0,256	0,510	0,010	0,98	100	2649	7	2653	19	2659	44	1,95907012 5	2,01	0,17958117 8	0,41
120098A_83	0	932964	0,0018	262	275	583	0,1241	0,0004	6,449	0,130	0,377	0,008	0,99	102	2016	6	2039	18	2062	35	2,65327372 6	2,00	0,12409936 6	0,32
120098A_84	0	110768	0,0155	35	76	76	0,1154	0,0006	5,436	0,111	0,342	0,007	0,97	100	1886	9	1891	17	1894	33	2,92733700 6	2,01	0,11541634 7	0,51
120098A_85	0	152320	0,0113	44	65	103	0,1180	0,0006	5,682	0,116	0,349	0,007	0,97	100	1926	8	1929	17	1931	33	2,86351525 2	2,01	0,11800766 7	0,47
120098A_86	0	148200	0,0116	40	28	93	0,1254	0,0006	6,508	0,133	0,376	0,008	0,97	101	2035	8	2047	18	2059	35	2,65690842 9	2,01	0,12540509 1	0,48
120098A_87	0	513644	0,0034	167	314	311	0,1266	0,0005	6,799	0,138	0,389	0,008	0,98	103	2052	7	2086	18	2120	36	2,56807776	2,01	0,12664254 4	0,40
120098A_88	0	170370	0,0101	52	86	112	0,1209	0,0005	5,978	0,122	0,359	0,007	0,98	100	1970	8	1973	18	1975	34	2,78871844 5	2,01	0,12090743	0,45
120098A_89	0	360939	0,0048	103	49	165	0,1823	0,0006	12,929	0,260	0,514	0,010	0,99	100	2674	5	2675	19	2675	44	1,94399562 4	2,00	0,18229234 6	0,32
120098A_90	0	75437	0,0228	23	20	33	0,1947	0,0009	14,386	0,293	0,536	0,011	0,98	99	2782	7	2775	19	2766	45	1,86611847 4	2,01	0,19470101 6	0,45
120098A_91	0	230834	0,0075	73	49	84	0,2573	0,0010	22,946	0,465	0,647	0,013	0,98	100	3230	6	3225	20	3216	51	1,54578222 4	2,01	0,25725452 9	0,39
120098A_92	0	820	2,1004	90	271	148	0,1732	0,0006	8,660	0,175	0,363	0,007	0,99	77	2589	6	2303	18	1995	34	2,75717032	2,00	0,17318021 8	0,33
120098A_93	0	291345	0,0059	81	88	198	0,1172	0,0004	5,599	0,113	0,346	0,007	0,99	100	1914	6	1916	17	1918	33	2,88661923 4	2,00	0,11721890 2	0,34
120098A_94	0	368496	0,0047	103	112	252	0,1165	0,0004	5,546	0,112	0,345	0,007	0,98	101	1903	6	1908	17	1912	33	2,89552045 3	2,00	0,11646636 9	0,36
120098A_95	0	99770	0,0173	34	48	42	0,2053	0,0008	15,893	0,322	0,561	0,011	0,98	100	2869	6	2870	19	2873	46	1,78099935	2,01	0,20528791 2	0,40
120098A_96	short	430253	0,0040	115	67	285	0,1168	0,0005	5,745	0,117	0,357	0,007	0,98	103	1908	8	1938	17	1966	34	2,80405120 1	2,01	0,11682987 4	0,43
120098A_97	0	755294	0,0023	268	845	491	0,1226	0,0004	6,139	0,124	0,363	0,007	0,99	100	1995	6	1996	17	1997	34	2,75405521 3	2,00	0,12262297 4	0,32
120098A_98	0	337089	0,0051	86	5	229	0,1181	0,0004	5,659	0,114	0,347	0,007	0,98	100	1928	6	1925	17	1922	33	2,87841239 7	2,00	0,11813698 1	0,36
120098A_99	0	326820	0,0053	94	107	198	0,1308	0,0005	7,017	0,142	0,389	0,008	0,98	100	2109	7	2114	18	2119	36	2,57011788 6	2,01	0,13080011 5	0,39
120098A_100	0	687546	0,0025	181	52	433	0,1203	0,0004	6,220	0,125	0,375	0,008	0,99	105	1960	6	2007	17	2053	35	2,66658420 2	2,00	0,12028567 1	0,34
120098A_101	inclusions	236962	0,0073	68	76	155	0,1163	0,0006	5,784	0,119	0,361	0,007	0,96	104	1901	10	1944	18	1985	34	2,77325157 8	2,01	0,11634096 8	0,56
120098A_102	0	154762	0,0111	46	77	105	0,1169	0,0006	5,590	0,114	0,347	0,007	0,97	101	1909	9	1915	17	1920	33	2,88231727 7	2,01	0,11686267 9	0,48
120098A_103	inclusions	236286	0,0073	70	40	124	0,1987	0,0007	12,372	0,250	0,452	0,009	0,98	85	2816	6	2633	19	2402	40	2,21464286 1	2,01	0,19872007 7	0,35
120098A_104	0	3030	0,5681	69	84	145	0,1227	0,0005	6,475	0,132	0,383	0,008	0,98	105	1996	8	2043	18	2089	36	2,61297024 3	2,01	0,12271249 2	0,44
120098A_105	0	179887	0,0096	52	42	97	0,1519	0,0006	9,173	0,185	0,438	0,009	0,98	99	2367	6	2355	18	2342	39	2,28292952 1	2,01	0,15188142 2	0,37
120098A_106	0	126297	0,0136	36	46	85	0,1183	0,0005	5,713	0,116	0,350	0,007	0,97	100	1931	8	1933	17	1935	33	2,85619927 7	2,01	0,11833549	0,46
120098A_107	0	519333	0,0033	139	84	327	0,1200	0,0004	6,198	0,125	0,375	0,008	0,99	105	1956	6	2004	17	2051	35	2,66916679 7	2,00	0,11998573 7	0,32

Appendix 3(13) U-Pb analyses.

				Pb	Th	U									Derived ages and errors						T-W (Pbc corrected)			
Sample	Comment	Pb206/Pb204	206Pbc(%)	ppm			207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	r	% Concordance	207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	238U/206Pb	1s %	207Pb/206Pb	1s %
120100A_01	0	365379	0,0047	96	47	259	0,1177	0,0005	5,415	0,110	0,334	0,007	0,98	97	1921	7	1887	17	1857	32	2,99593455	2,0	0,117657379	0,39
120100A_02	0	157005	0,0110	44	42	106	0,1184	0,0005	5,705	0,116	0,350	0,007	0,97	100	1932	8	1932	17	1933	33	2,86066387	2,0	0,118359358	0,46
120100A_03	0	247911	0,0069	67	48	150	0,1165	0,0005	6,282	0,128	0,391	0,008	0,98	112	1903	8	2016	18	2128	36	2,55642688	2,0	0,116467595	0,44
120100A_04	0	524860	0,0033	134	50	359	0,1175	0,0004	5,598	0,113	0,345	0,007	0,99	100	1919	6	1916	17	1913	33	2,89496321	2,0	0,117531491	0,33
120100A_05	0	336805	0,0051	101	72	149	0,1970	0,0007	14,486	0,292	0,533	0,011	0,98	98	2802	6	2782	19	2755	45	1,87541029	2,0	0,197033229	0,35
120100A_06	inclusions	578147	0,0030	157	116	433	0,1204	0,0004	5,237	0,106	0,315	0,006	0,98	90	1962	6	1859	17	1767	31	3,17037895	2,0	0,120421003	0,35
120100A_07	0	208717	0,0082	61	125	145	0,1197	0,0005	5,608	0,114	0,340	0,007	0,98	97	1952	7	1917	17	1885	33	2,94399518	2,0	0,11973762	0,38
120100A_08	inclusions	917863	0,0019	247	142	612	0,1161	0,0004	5,679	0,115	0,355	0,007	0,98	103	1898	6	1928	17	1957	34	2,81972247	2,0	0,116139069	0,36
120100A_09	0	169921	0,0101	51	92	116	0,1177	0,0005	5,627	0,114	0,347	0,007	0,98	100	1922	7	1920	17	1918	33	2,88512125	2,0	0,117743885	0,41
120100A_10a	0	207647	0,0083	56	34	142	0,1177	0,0005	5,630	0,115	0,347	0,007	0,98	100	1921	8	1921	17	1920	33	2,88192803	2,0	0,117669873	0,44
120100A_10b	0	334310	0,0051	86	22	223	0,1181	0,0005	5,775	0,117	0,355	0,007	0,98	101	1928	7	1943	17	1956	34	2,82083438	2,0	0,118145251	0,38
120100A_11	0	1011298	0,0017	289	176	492	0,1707	0,0005	11,443	0,230	0,486	0,010	0,99	100	2565	5	2560	19	2554	42	2,05722637	2,0	0,170741614	0,31
120100A_12	0	546679	0,0031	147	112	364	0,1167	0,0004	5,717	0,116	0,355	0,007	0,98	103	1906	7	1934	17	1961	34	2,81329225	2,0	0,116651532	0,37
120100A_13	0	406854	0,0042	109	69	272	0,1181	0,0004	5,769	0,117	0,354	0,007	0,98	101	1927	7	1942	17	1956	34	2,82170558	2,0	0,118064904	0,37
120100A_14	short	281885	0,0061	94	163	124	0,1897	0,0010	14,087	0,290	0,538	0,011	0,97	101	2740	9	2756	19	2777	45	1,85702644	2,0	0,189734626	0,54
120100A_15	0	459400	0,0037	126	112	305	0,1163	0,0004	5,726	0,116	0,357	0,007	0,99	104	1901	6	1935	17	1968	34	2,80147983	2,0	0,116343297	0,35
120100A_16	0	840827	0,0020	237	242	542	0,1216	0,0004	6,155	0,124	0,367	0,007	0,99	102	1981	6	1998	17	2015	35	2,72490875	2,0	0,121648529	0,32
120100A_17	0	1517527	0,0011	458	733	962	0,1237	0,0004	6,370	0,128	0,373	0,007	0,99	102	2011	5	2028	18	2045	35	2,67797009	2,0	0,123724426	0,31
120100A_18	0	325979	0,0053	94	143	218	0,1193	0,0004	5,830	0,118	0,354	0,007	0,99	101	1946	6	1951	17	1956	34	2,8212597	2,0	0,119299741	0,34
120100A_19	0	193107	0,0089	55	56	131	0,1199	0,0007	5,769	0,119	0,349	0,007	0,96	99	1955	10	1942	18	1929	33	2,86666198	2,0	0,119946085	0,54
120100A_20	0	130177	0,0132	38	59	89	0,1182	0,0005	5,619	0,114	0,345	0,007	0,98	99	1929	8	1919	17	1910	33	2,90048826	2,0	0,118205838	0,42
120100A_21	0	5015	0,3433	133	345	250	0,1245	0,0005	6,417	0,130	0,374	0,007	0,98	101	2021	7	2035	18	2048	35	2,67417719	2,0	0,124461141	0,37
120100A_22a	0	1557708	0,0011	463	373	878	0,1690	0,0005	9,798	0,197	0,420	0,008	0,99	89	2548	5	2416	18	2262	38	2,37860466	2,0	0,169025746	0,30
120100A_22b	0	362564	0,0047	101	56	192	0,1599	0,0005	9,843	0,198	0,446	0,009	0,99	97	2455	5	2420	18	2379	40	2,24038757	2,0	0,159942025	0,33
120100A_23	common Pb	721521	0,0024	258	487	314	0,1876	0,0006	14,074	0,283	0,544	0,011	0,99	103	2722	5	2755	19	2800	45	1,83831313	2,0	0,187648543	0,31
120100A_24	0	129804	0,0133	36	29	96	0,1158	0,0005	5,111	0,104	0,320	0,006	0,98	95	1892	8	1838	17	1791	31	3,12297231	2,0	0,11576942	0,43
120100A_25	0	436469	0,0039	135	209	278	0,1246	0,0005	6,391	0,130	0,372	0,007	0,98	101	2023	7	2031	18	2039	35	2,68720844	2,0	0,12455949	0,42
120100A_26	inclusions	259072	0,0066	90	148	111	0,1942	0,0007	14,845	0,299	0,554	0,011	0,99	102	2778	5	2805	19	2844	46	1,80346284	2,0	0,194168972	0,34
120100A_27	0	1414143	0,0012	385	304	956	0,1190	0,0004	5,752	0,116	0,351	0,007	0,99	100	1941	5	1939	17	1938	33	2,85143599	2,0	0,118952331	0,30
120100A_28	0	294636	0,0058	86	134	205	0,1163	0,0004	5,471	0,111	0,341	0,007	0,98	100	1901	7	1896	17	1892	33	2,9321362	2,0	0,116348532	0,38
120100A_29	0	192608	0,0089	62	95	94	0,1715	0,0006	11,550	0,234	0,488	0,010	0,98	100	2573	6	2569	19	2563	42	2,04781008	2,0	0,171539586	0,38
120100A_30	0	1207838	0,0014	372	291	519	0,2172	0,0007	16,524	0,332	0,552	0,011	0,99	96	2960	5	2908	19	2832	46	1,81246806	2,0	0,217206514	0,30
120100A_31	0	326702	0,0053	85	34	226	0,1167	0,0004	5,523	0,112	0,343	0,007	0,98	100	1906	6	1904	17	1902	33	2,91322731	2,0	0,116695863	0,35
120100A_32	0	339019	0,0051	92	106	235	0,1181	0,0004	5,584	0,113	0,343	0,007	0,98	99	1928	7	1914	17	1900	33	2,91725418	2,0	0,118147178	0,37
120100A_33	0	1089346	0,0016	347	840	934	0,1179	0,0004	4,495	0,091	0,277	0,006	0,98	82	1924	6	1730	17	1574	28	3,61548727	2,0	0,117877347	0,36
120100A_34	0	2094	0,8222	55	55	130	0,1160	0,0005	5,747	0,117	0,359	0,007	0,98	104	1896	8	1938	17	1979	34	2,78345465	2,0	0,116013225	0,42
120100A_35	0	548021	0,0031	164	249	351	0,1248	0,0004	6,372	0,129	0,370	0,007	0,98	100	2027	6	2028	18	2030	35	2,70127587	2,0	0,124838002	0,35
120100A_36	0	443135	0,0039	118	114	323	0,1159	0,0004	5,207	0,105	0,326	0,007	0,98	96	1894	7	1854	17	1818	32	3,06998418	2,0	0,115932245	0,37
120100A_37	0	90159	0,0191	31	85	62	0,1183	0,0007	5,669	0,117	0,348	0,007	0,96	100	1930	10	1927	18	1923	33	2,87695405	2,0	0,118285396	0,58
120100A_38	0	141269	0,0122	40	44	91	0,1242	0,0006	6,290	0,129	0,367	0,007	0,97	100	2017	9	2017	18	2017	35	2,7219748	2,0	0,124175431	0,52
120100A_39	0	273736	0,0063	86	48	97	0,2693	0,0009	24,858	0,501	0,669	0,013	0,99	100	3302	5	3303	20	3304	52	1,4937133	2,0	0,269298836	0,34
120100A_40	0	129398	0,0133	37	45	87	0,1195	0,0006	5,803	0,119	0,352	0,007	0,97	100	1949	9	1947	18	1945	34	2,8394909	2,0	0,119502365	0,52
120100A_41	short	316894	0,0054	89	86	207	0,1212	0,0006	6,078	0,124	0,364	0,007	0,97	101	1974	8	1987	18	1999	34	2,75001966	2,0	0,121221236	0,48
120100A_42	0	3776	0,4559	121	139	547	0,1073	0,0005	2,823	0,057	0,191	0,004	0,98	64	1754	8	1362	15	1126	21	5,23929429	2,0	0,107271986	0,42
120100A_43	0	432979	0,0040	126	223	315	0,1135	0,0004	5,104	0,103	0,326	0,007	0,99	98	1857	6	1837	17	1819	32	3,06733105	2,0	0,113549769	0,34
120100A_44	0	684770	0,0025	177	48	462	0,1175	0,0004	5,703	0,115	0,352	0,007	0,99	101	1918	6	1932	17	1945	34	2,84009217	2,0	0,117481515	0,34
120100A_45	0	1483931	0,0012	388	50	835	0,1428	0,0004	8,312	0,167	0,422	0,008	0,99	100	2261	5	2266	18	2270	38	2,36855938	2,0	0,142789718	0,31
120100A_46	0	308906	0,0056	78	3	213	0,1162	0,0004	5,523	0,112	0,345	0,007	0,98	101	1898	7	1904	17	1910	33	2,90027436	2,0	0,11617229	0,39
120100A_47	0	673866	0,0026	201	264	326	0,1674	0,0005	11,323	0,228	0,491	0,010	0,99	102	2532	5	2550	19	2573	42	2,0384945	2,0	0,167398964	0,32
120100A_48	0	107560	0,0160	29	24	73	0,1175	0,0006	5,667	0,116	0,350	0,007	0,97	101	1918	9	1926	18	1934	34	2,85840503	2,0	0,117491971	0,52
120100A_49	inclusions	407448	0,0042	116	26	171	0,2097	0,0007	16,370	0,330	0,566	0,011	0,99	100	2903	6	2899	19	2893	47	1,76588053	2,0	0,209661287	0,34
120100A_50	0	575604	0,0030	180	354	393	0,1189	0,0004	5,713	0,116	0,349	0,007	0,98	99	1940	7	1933	17	1928	33	2,86902657	2,0	0,118887221	0,37
120100A_51	0	12827	0,1342	464	624	920	0,1652	0,0005	9,126	0,184	0,401	0,008	0,99	87	2510	5	2351	18	2172	37	2,49619919	2,0	0,165219714	0,31
120100A_52	0	383629	0,0045	105	48	234	0,1447	0,0005	7,778	0,157	0,390	0,008	0,99	93	2284	6	2206	18	2123	36	2,56449356	2,0	0,144665724	0,33
120100A_53	0	104095	0,0165	29	22	68	0,1226	0,0006	6,115	0,125	0,362	0,007	0,97	100	1995	8	1992	18	1990	34	2,76486515	2,0	0,122613135	0,45
120100A_54	0	4499	0,3826	107	115	258	0,1185	0,0004	5,741	0,116	0,351	0,007	0,98	100	1933	7	1938	17	1942	34	2,84535302	2,0	0,118482454	0,38
120100A_55	0	443399	0,0039	117	64	304	0,1231	0,0004	5,893	0,119	0,347	0,007	0,98	96	2001	6	1960	17	1922	33	2,8794634	2,0	0,123067554	0,36
120100A_56	0	512695	0,0034	143	145	364	0,1139	0,0004	5,264	0,107	0,335	0,007	0,98	100	1863	7	1863	17	1863	32	2,98345594	2,0	0,113907582	0,39
120100A_57	0	2369	0,7266	57	98	126	0,1142	0,0005	5,577	0,113	0,354	0,007	0,98	105	1867	8	1912	17	1955	34	2,82277504	2,0	0,114168136	0,42
120100A_58	0	230156	0,0075	64	64	157	0,1184	0,0004	5,693	0,115	0,349	0,007	0,98	100	1933	7	1930	17	1928	33	2,86813464	2,0	0,11843239	0,38
120100A_59	0	383659	0,0045	113	92	189	0,1682	0,0006	11,177	0,226	0,482	0,010	0,99	100	2540	6	2538	19	2535	42	2,07527251	2,0	0,168229525	0,35
120100A_60	U tripped	813997	0,0021	244	174	345	0,2008	0,0006	15,533	0,313	0,561	0,011	0,99	101	2832	5	2848	19	2871	46	1,78204124	2,0	0,200751913	0,32
120100A_61	0	5277	0,3262	166	263	573	0,1115	0,0004	3,798	0,077	0,247	0,005	0,98	78	1824	7	1592	16	1423	26	4,04890097	2,0	0,11152466	0,36
120100A_62	0	357989	0,0048	99	100	251	0,1208	0,0004	5,663	0,114	0,340	0,007	0,99	96	1968	6	1926	17	1887	33	2,94067209	2,0	0,120780943	0,35
120100A_63	0	175698	0,0098	56	71	80	0,1894	0,0008	13,723	0,279	0,526	0,011	0,98	99	2737	7	2731	19	2723	44	1,90274715	2,0	0,189378229	0,42
120100A_64	rising Pb/P	152197	0,0113	45	55	90	0,1447	0,0006	8,002	0,162	0,401	0,008	0,98	95	2284	7	2231	18	2175	37	2,49248967	2,0	0,14465178	0,41

Appendix 3(14) U-Pb analyses.

120100A_65	0	244601	0,0070	73	69	125	0,1631	0,0006	10,490	0,212	0,467	0,009	0,98	99	2488	6	2479	19	2468	41	2,14358381	2,01	0,163091616	0,39
120100A_66	0	119301	0,0144	39	80	77	0,1274	0,0007	6,445	0,133	0,367	0,007	0,96	98	2063	10	2038	18	2014	35	2,72608694	2,01	0,127425187	0,56
120100A_67	0	474621	0,0036	123	64	315	0,1165	0,0004	5,769	0,117	0,359	0,007	0,98	104	1903	7	1942	17	1979	34	2,78358143	2,00	0,11646044	0,36
120100A_68	0	698807	0,0025	235	504	461	0,1668	0,0006	8,309	0,168	0,361	0,007	0,99	79	2526	6	2265	18	1988	34	2,76772406	2,00	0,166790689	0,34
120100A_69	0	479089	0,0036	125	48	330	0,1174	0,0004	5,591	0,113	0,345	0,007	0,98	100	1918	7	1915	17	1912	33	2,89616494	2,00	0,117435033	0,37
120100A_70	0	590767	0,0029	220	705	405	0,1192	0,0004	5,719	0,116	0,348	0,007	0,98	99	1945	7	1934	17	1925	33	2,87438369	2,00	0,11923137	0,37
120100A_71	0	968835	0,0018	248	29	658	0,1216	0,0004	5,879	0,119	0,351	0,007	0,98	98	1980	6	1958	17	1938	33	2,85212752	2,00	0,121602616	0,36
120100A_72	inclusions	192188	0,0090	54	55	139	0,1181	0,0006	5,385	0,110	0,331	0,007	0,97	95	1928	9	1882	17	1841	32	3,02516928	2,01	0,118148709	0,52
120100A_73	0	480418	0,0036	133	110	308	0,1246	0,0004	6,389	0,129	0,372	0,007	0,99	101	2023	6	2031	18	2039	35	2,68831146	2,00	0,124572768	0,34
120100A_74	0	324381	0,0053	105	242	225	0,1162	0,0004	5,497	0,111	0,343	0,007	0,98	100	1898	7	1900	17	1902	33	2,91357345	2,01	0,116167568	0,39
120100A_75	0	178308	0,0097	56	112	123	0,1174	0,0006	5,585	0,114	0,345	0,007	0,97	100	1917	8	1914	17	1911	33	2,89854131	2,01	0,117410056	0,47
120100A_76	0	458794	0,0038	150	307	290	0,1246	0,0004	6,489	0,131	0,378	0,008	0,98	102	2023	6	2044	18	2066	35	2,64735525	2,00	0,124597595	0,35
120100A_77	0	1569336	0,0011	427	315	1069	0,1224	0,0004	5,903	0,119	0,350	0,007	0,99	97	1991	6	1962	17	1934	33	2,85785311	2,00	0,122361769	0,31
120100A_78	0	427824	0,0040	123	161	288	0,1187	0,0004	5,793	0,117	0,354	0,007	0,98	101	1936	7	1945	17	1954	34	2,82451434	2,00	0,118678648	0,37
120100A_79	0	1853405	0,0009	477	91	1217	0,1223	0,0004	6,125	0,123	0,363	0,007	0,99	100	1991	5	1994	17	1997	34	2,75378879	2,00	0,122340202	0,31
120100A_80	0	546812	0,0031	182	207	258	0,1858	0,0006	12,967	0,261	0,506	0,010	0,99	98	2705	5	2677	19	2641	43	1,97524011	2,00	0,185761572	0,33
120100A_81	0	191344	0,0090	54	65	136	0,1180	0,0006	5,441	0,111	0,334	0,007	0,97	97	1926	9	1891	17	1860	32	2,99061982	2,01	0,118011467	0,49
120100A_82	0	512784	0,0034	155	174	259	0,1677	0,0006	10,931	0,220	0,473	0,009	0,99	98	2535	6	2517	19	2495	41	2,11589037	2,00	0,16774153	0,33
120100A_83	0	506929	0,0034	152	147	243	0,1747	0,0006	11,971	0,241	0,497	0,010	0,99	100	2604	5	2602	19	2600	43	2,01258369	2,00	0,174738717	0,33
120100A_84	inclusions	564845	0,0030	159	161	405	0,1179	0,0005	5,407	0,110	0,333	0,007	0,98	96	1925	7	1886	17	1851	32	3,00716251	2,01	0,117929296	0,40
120100A_85	0	274258	0,0063	76	69	186	0,1185	0,0005	5,740	0,116	0,351	0,007	0,98	100	1933	7	1937	17	1941	34	2,84559575	2,01	0,118471224	0,39
120100A_86a	0	50175	0,0343	17	24	23	0,1898	0,0010	13,708	0,281	0,524	0,011	0,97	99	2741	8	2730	19	2715	45	1,90927237	2,02	0,189818835	0,52
120100A_86b	0	326555	0,0053	93	107	220	0,1193	0,0005	5,835	0,118	0,355	0,007	0,98	101	1946	7	1952	17	1956	34	2,82038517	2,01	0,119348896	0,39
120100A_87	0	705814	0,0024	194	243	494	0,1170	0,0004	5,499	0,111	0,341	0,007	0,99	99	1911	6	1900	17	1891	33	2,933841	2,00	0,117005898	0,33
120100A_88	0	266676	0,0065	80	78	131	0,1687	0,0006	11,275	0,228	0,485	0,010	0,98	100	2545	6	2546	19	2548	42	2,06306439	2,01	0,168712287	0,37
120100A_89	0	377046	0,0046	116	103	176	0,1985	0,0007	13,977	0,282	0,511	0,010	0,99	95	2814	6	2748	19	2660	44	1,95768893	2,00	0,198457714	0,34
120100A_90	0	131895	0,0131	41	39	60	0,1898	0,0008	13,760	0,280	0,526	0,011	0,98	99	2740	7	2733	19	2724	44	1,90166316	2,01	0,189782221	0,43
120100A_91	0	2979	0,5778	54	38	137	0,1133	0,0005	5,414	0,110	0,347	0,007	0,98	104	1853	7	1887	17	1918	33	2,88518306	2,01	0,113281894	0,41
120100A_92	0	190105	0,0091	54	61	135	0,1176	0,0005	5,439	0,110	0,335	0,007	0,98	97	1920	7	1891	17	1865	32	2,98091434	2,01	0,117587738	0,41
120100A_93	0	539727	0,0032	140	40	372	0,1175	0,0004	5,625	0,114	0,347	0,007	0,98	100	1919	6	1920	17	1921	33	2,88122541	2,00	0,117548717	0,35
120100A_94	0	196898	0,0087	60	100	134	0,1185	0,0006	5,743	0,118	0,352	0,007	0,97	100	1933	9	1938	18	1942	34	2,84394287	2,01	0,118458448	0,49
120100A_95	0	1079366	0,0016	304	291	674	0,1276	0,0004	6,736	0,136	0,383	0,008	0,99	101	2065	6	2077	18	2090	36	2,61202362	2,00	0,127601681	0,34
120100A_96	0	335763	0,0051	102	82	150	0,2005	0,0007	14,750	0,298	0,534	0,011	0,99	97	2830	6	2799	19	2757	45	1,87412767	2,00	0,200489811	0,34
120100A_97	0	601162	0,0029	159	86	408	0,1159	0,0004	5,635	0,114	0,353	0,007	0,98	103	1894	7	1921	17	1947	34	2,836284	2,01	0,115916799	0,39
120100A_98	0	147315	0,0117	41	36	104	0,1176	0,0006	5,469	0,112	0,337	0,007	0,97	98	1921	9	1896	17	1873	33	2,9657205	2,01	0,117644547	0,49
120100A_99	0	477944	0,0036	139	182	336	0,1156	0,0004	5,428	0,110	0,340	0,007	0,98	100	1890	7	1889	17	1889	33	2,93748715	2,00	0,115631245	0,38
120100A_10	0	9993	0,1723	210	513	420	0,1166	0,0004	5,754	0,116	0,358	0,007	0,98	104	1904	7	1940	17	1973	34	2,79295886	2,00	0,116558248	0,38
120100A_10	0	556659	0,0031	150	99	385	0,1168	0,0004	5,561	0,112	0,345	0,007	0,98	100	1908	6	1910	17	1912	33	2,89605643	2,00	0,116806249	0,35
120100A_10	inclusions	530722	0,0032	148	92	311	0,1442	0,0005	8,104	0,164	0,408	0,008	0,99	97	2278	6	2243	18	2204	37	2,45345009	2,00	0,144202964	0,34
120100A_10	0	198470	0,0087	56	81	219	0,1136	0,0006	3,391	0,070	0,216	0,004	0,97	68	1858	9	1502	16	1263	23	4,61981805	2,00	0,113621612	0,52
120100A_10	0	939766	0,0018	338	622	434	0,1831	0,0006	13,082	0,264	0,518	0,010	0,99	100	2681	6	2686	19	2691	44	1,93007296	2,00	0,183119554	0,34
120100A_10	0	353383	0,0049	103	136	222	0,1323	0,0005	6,941	0,141	0,381	0,008	0,98	98	2128	6	2104	18	2079	36	2,62695422	2,00	0,132252134	0,39
120100A_10	0	30608	0,0562	585	84	1173	0,1889	0,0006	11,375	0,229	0,437	0,009	0,99	85	2733	5	2554	19	2336	39	2,28956045	2,00	0,188888356	0,32
120100A_10	0	641154	0,0027	199	463	411	0,1174	0,0004	6,032	0,122	0,373	0,007	0,98	107	1916	7	1980	17	2043	35	2,6824498	2,00	0,117355067	0,38
120100A_10	0	477539	0,0036	131	112	327	0,1158	0,0005	5,588	0,113	0,350	0,007	0,98	102	1893	7	1914	17	1934	33	2,85819645	2,00	0,115833399	0,40
120100A_10	0	1927	0,8933	50	43	66	0,2084	0,0009	16,418	0,333	0,571	0,011	0,98	101	2893	7	2901	19	2914	47	1,75006504	2,00	0,208387148	0,41
120100A_11	0	350631	0,0049	123	190	169	0,1825	0,0007	12,522	0,253	0,498	0,010	0,98	97	2675	6	2644	19	2604	43	2,00920088	2,0	0,18247203	0,38

Appendix 3(15) U-Pb analyses.

				Pb	Th	U									Derived ages and errors						T-W (Pbc corrected)			
Sample	Comment	Pb206/Pb204	206Pbc(%)	ppm			207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	r	% Concordance	207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	238U/206Pb	1s %	207Pb/206Pb	1s %
120112B_01	0	274640	0,0063	91	211	197	0,1230	0,0005	5,656	0,115	0,334	0,007	0,98	93	2000	7	1925	17	1855	32	2,99837954 4	2,01	0,12300510 1	0,39
120112B_02	0	221751	0,0078	64	78	153	0,1163	0,0006	5,562	0,115	0,347	0,007	0,96	101	1901	10	1910	18	1919	33	2,88369795 8	2,01	0,11633678 4	0,55
120112B_03	0	332926	0,0052	86	17	216	0,1164	0,0005	5,914	0,121	0,368	0,007	0,97	106	1902	8	1963	18	2022	35	2,71390843 6	2,01	0,11640142 6	0,46
120112B_04	0	153969	0,0112	44	53	124	0,1169	0,0005	4,777	0,097	0,296	0,006	0,98	88	1910	8	1781	17	1673	29	3,37520460 2	2,01	0,11693369	0,43
120112B_05	0	178263	0,0097	51	49	106	0,1361	0,0006	7,553	0,154	0,403	0,008	0,98	100	2178	8	2179	18	2181	37	2,48373396 7	2,01	0,13606030 4	0,44
120112B_06	0	141171	0,0122	45	45	60	0,2117	0,0009	16,525	0,336	0,566	0,011	0,98	99	2919	7	2908	19	2892	47	1,76627005 2	2,01	0,21169117 1	0,42
120112B_07	0	192936	0,0089	54	47	183	0,1142	0,0005	3,976	0,081	0,253	0,005	0,98	78	1867	8	1629	16	1452	26	3,95871022 9	2,01	0,11417031 4	0,43
120112B_08	0	202828	0,0085	65	120	145	0,1234	0,0005	5,717	0,116	0,336	0,007	0,98	93	2006	7	1934	17	1868	32	2,97586876 3	2,01	0,12338134 4	0,40
120112B_09	0	306158	0,0056	104	147	145	0,1922	0,0008	13,372	0,271	0,505	0,010	0,98	95	2761	7	2706	19	2634	43	1,98143619 3	2,01	0,19216500 2	0,40
120112B_10	uneven signa	9790	0,1758	160	112	397	0,1147	0,0005	5,600	0,114	0,354	0,007	0,96	104	1876	[illegible]	1916	17	1954	34	2,82497795 4	2,01	0,11473315	0,40
120112B_11	0	199546	0,0086	61	105	136	0,1202	0,0005	5,828	0,118	0,352	0,007	0,98	99	1959	7	1951	17	1943	34	2,84367653 1	2,01	0,12019348 5	0,42
120112B_12	0	422039	0,0041	114	82	288	0,1173	0,0004	5,684	0,115	0,351	0,007	0,98	101	1915	7	1929	17	1942	34	2,84527957 8	2,00	0,11728511 6	0,38
120112B_13	0	354988	0,0048	115	217	230	0,1249	0,0005	6,367	0,129	0,370	0,007	0,98	100	2027	7	2028	18	2028	35	2,70480389 3	2,01	0,12490549 5	0,40
120112B_14	0	60923	0,0283	22	65	42	0,1170	0,0008	5,594	0,117	0,347	0,007	0,94	100	1911	13	1915	18	1919	33	2,88430054 2	2,02	0,11701832 2	0,70
120112B_15	0	324650	0,0053	90	78	226	0,1161	0,0005	5,501	0,112	0,344	0,007	0,98	100	1897	7	1901	17	1904	33	2,90962595 5	2,01	0,11609537 8	0,40
120112B_16	0	337920	0,0051	92	74	236	0,1148	0,0006	5,435	0,111	0,343	0,007	0,97	101	1877	9	1890	17	1903	33	2,91251321 3	2,01	0,11481502 5	0,49
120112B_17	0	368845	0,0047	102	76	249	0,1199	0,0005	5,869	0,119	0,355	0,007	0,98	100	1954	8	1957	17	1959	34	2,81607376 6	2,01	0,11986048 6	0,43
120112B_18	0	372762	0,0046	99	39	252	0,1198	0,0005	5,868	0,119	0,355	0,007	0,98	100	1953	7	1956	17	1960	34	2,81433095 6	2,01	0,11977180 3	0,41
120112B_19	0	162438	0,0106	46	49	111	0,1187	0,0006	5,736	0,117	0,350	0,007	0,97	100	1937	9	1937	18	1937	34	2,85324879 8	2,01	0,11870943 6	0,48
120112B_20	0	194664	0,0088	51	17	133	0,1188	0,0005	5,740	0,117	0,350	0,007	0,98	100	1938	8	1937	17	1937	33	2,85389076 3	2,01	0,11880903	0,43
120112B_21	0	192754	0,0089	56	22	76	0,1929	0,0007	16,199	0,328	0,609	0,012	0,98	111	2767	6	2889	19	3066	49	1,64173442 1	2,01	0,19288301 6	0,38
120112B_22	0	566365	0,0030	171	271	378	0,1200	0,0005	5,951	0,120	0,360	0,007	0,98	101	1956	7	1969	17	1981	34	2,78045530 8	2,00	0,12001313 8	0,38
120112B_23	0	350106	0,0049	91	33	246	0,1158	0,0004	5,448	0,110	0,341	0,007	0,98	100	1892	7	1892	17	1892	33	2,93091068 1	2,00	0,11579780 6	0,38
120112B_24	0	185531	0,0093	51	49	128	0,1170	0,0005	5,594	0,114	0,347	0,007	0,97	100	1911	8	1915	17	1919	33	2,88365140 3	2,01	0,11700070 8	0,47
120112B_25	0	166414	0,0103	52	104	116	0,1168	0,0005	5,540	0,113	0,344	0,007	0,98	100	1908	8	1907	17	1905	33	2,90771123 9	2,01	0,11683937 8	0,45
120112B_26	0	885215	0,0019	232	51	535	0,1350	0,0005	7,398	0,149	0,398	0,008	0,99	100	2164	6	2161	18	2158	37	2,51539532	2,00	0,13496813 6	0,34
120112B_27	0	112433	0,0153	34	54	78	0,1164	0,0006	5,577	0,114	0,347	0,007	0,97	101	1902	9	1913	17	1922	33	2,87803960 4	2,01	0,11642041 4	0,51
120112B_28	0	207539	0,0083	59	72	145	0,1173	0,0005	5,554	0,113	0,344	0,007	0,98	99	1915	8	1909	17	1904	33	2,91067960 1	2,01	0,11725230 2	0,43
120112B_29	0	222838	0,0077	62	54	144	0,1254	0,0006	6,409	0,131	0,371	0,007	0,98	100	2035	8	2034	18	2032	35	2,69843516 7	2,01	0,12543879 4	0,45
120112B_30	short	563346	0,0031	164	212	368	0,1191	0,0005	6,039	0,123	0,368	0,007	0,98	104	1942	8	1982	18	2019	35	2,71858915 1	2,01	0,11908072 1	0,43
120112B_31	0	265830	0,0065	70	26	182	0,1190	0,0005	5,761	0,117	0,351	0,007	0,98	100	1942	8	1941	17	1940	34	2,84851014 7	2,01	0,11902366 2	0,44
120112B_32	0	457976	0,0038	126	103	321	0,1185	0,0005	5,595	0,113	0,343	0,007	0,98	98	1933	7	1915	17	1899	33	2,91908724 3	2,01	0,11845354 2	0,40
120112B_33		1092447	0,0016	296	253	905	0,1184	0,0004	4,736	0,096	0,290	0,006	0,98	85	1933	6	1774	17	1642	29	3,44809740 6	2,00	0,11844583 2	0,36
120112B_34	inclusions	4837	0,3559	57	69	156	0,1144	0,0005	4,930	0,100	0,312	0,006	0,98	94	1871	7	1807	17	1753	31	3,20032628 7	2,01	0,11443348 4	0,41
120112B_35	0	1497	1,1497	35	38	86	0,1096	0,0005	5,211	0,107	0,345	0,007	0,97	107	1792	9	1854	17	1911	33	2,89877412	2,01	0,10956096 1	0,49
120112B_36	0	220741	0,0078	66	114	192	0,1168	0,0005	4,444	0,090	0,276	0,006	0,98	82	1908	8	1721	17	1571	28	3,62392404 3	2,01	0,11679254 5	0,44
120112B_37	0	175766	0,0098	53	70	118	0,1198	0,0006	5,916	0,121	0,358	0,007	0,97	101	1953	9	1964	18	1973	34	2,79226624 6	2,01	0,11981388 2	0,51
120112B_38	0	277216	0,0062	76	65	194	0,1169	0,0005	5,548	0,113	0,344	0,007	0,98	100	1909	7	1908	17	1907	33	2,90514045 9	2,01	0,11689672	0,40
120112B_39	0	187139	0,0092	55	70	124	0,1219	0,0006	6,103	0,125	0,363	0,007	0,97	101	1985	8	1991	18	1997	34	2,75456595 9	2,01	0,12193401 3	0,48
120112B_40	0	82167	0,0210	23	23	56	0,1191	0,0006	5,761	0,118	0,351	0,007	0,97	100	1943	9	1941	18	1938	34	2,85075936 8	2,01	0,11911424 2	0,53
120112B_41	0	235050	0,0073	71	104	163	0,1184	0,0005	5,668	0,115	0,347	0,007	0,98	99	1932	7	1927	17	1921	33	2,87998408 9	2,01	0,11839784	0,41
120112B_42	0	401327	0,0043	107	56	273	0,1167	0,0005	5,682	0,116	0,353	0,007	0,98	102	1906	8	1929	17	1949	34	2,83212039 5	2,01	0,11671012 6	0,44
120112B_43	0	245423	0,0070	69	64	167	0,1181	0,0005	5,759	0,117	0,354	0,007	0,98	101	1928	8	1940	17	1952	34	2,82784482	2,01	0,11810691	0,43
120112B_44	0	173674	0,0099	50	18	75	0,2087	0,0008	15,983	0,324	0,555	0,011	0,98	98	2896	6	2876	19	2848	46	1,80046975	2,01	0,20870341 8	0,39
120112B_45	0	240266	0,0072	75	97	129	0,1533	0,0006	9,450	0,192	0,447	0,009	0,98	100	2383	7	2383	18	2382	40	2,23665734 5	2,01	0,15329208 6	0,41
120112B_46	0	61905	0,0278	19	35	66	0,1198	0,0007	3,717	0,077	0,225	0,005	0,96	67	1953	10	1575	16	1309	24	4,44319041 7	2,01	0,11978844 9	0,59
120112B_47	0	152151	0,0113	43	44	104	0,1174	0,0007	5,678	0,117	0,351	0,007	0,96	101	1917	10	1928	18	1938	34	2,85124805 8	2,01	0,11740708 5	0,56
120112B_48	0	138941	0,0124	39	34	91	0,1241	0,0006	6,308	0,129	0,369	0,007	0,97	100	2016	9	2020	18	2023	35	2,71306805 4	2,01	0,12412055 5	0,48
120112B_49	0	218101	0,0079	64	83	158	0,1227	0,0005	5,621	0,114	0,332	0,007	0,98	93	1996	7	1919	17	1849	32	3,01053819 8	2,01	0,12274247 8	0,41
120112B_50	0	295044	0,0058	76	11	203	0,1181	0,0005	5,690	0,116	0,349	0,007	0,98	100	1928	8	1930	17	1932	33	2,86184879 2	2,01	0,11810316 6	0,42
120112B_51	0	130835	0,0132	37	40	91	0,1171	0,0006	5,572	0,114	0,345	0,007	0,97	100	1912	9	1912	17	1912	33	2,89677657 3	2,01	0,11707027 4	0,50
120112B_52	0	196554	0,0088	56	58	129	0,1237	0,0006	6,250	0,127	0,367	0,007	0,98	100	2010	8	2011	18	2013	35	2,72813112	2,01	0,12366284 4	0,45
120112B_53	0	195353	0,0088	56	65	134	0,1192	0,0005	5,782	0,118	0,352	0,007	0,98	100	1945	8	1944	17	1943	34	2,84302075 2	2,01	0,11923068 3	0,45
120112B_54	0	236442	0,0073	65	52	178	0,1186	0,0006	5,238	0,107	0,320	0,006	0,97	92	1936	9	1859	17	1791	31	3,12322070 4	2,01	0,11864694 6	0,50
120112B_55	0	8914	0,1931	218	131	359	0,1745	0,0006	12,084	0,244	0,502	0,010	0,98	101	2602	6	2611	19	2623	43	1,99138484 3	2,00	0,17452874 2	0,37
120112B_56	0	638795	0,0027	169	70	433	0,1185	0,0005	5,802	0,118	0,355	0,007	0,98	101	1934	7	1947	17	1959	34	2,81646768 2	2,01	0,11852672 4	0,40
120112B_57	0	322566	0,0053	90	90	224	0,1172	0,0005	5,605	0,114	0,347	0,007	0,98	100	1913	8	1917	17	1920	33	2,88171582 2	2,01	0,11715471 2	0,44
120112B_58	0	399387	0,0043	108	81	276	0,1180	0,0005	5,664	0,115	0,348	0,007	0,98	100	1926	7	1926	17	1925	33	2,87300127 7	2,01	0,11801116 5	0,40
120112B_59	0	156860	0,0110	44	42	121	0,1169	0,0005	5,026	0,102	0,312	0,006	0,97	92	1910	8	1824	17	1750	31	3,20727491 2	2,01	0,11691951 7	0,46
120112B_60	0	406789	0,0042	135	291	269	0,1232	0,0005	6,188	0,125	0,364	0,007	0,98	100	2002	7	2003	18	2003	34	2,74392466 2	2,01	0,12315560 3	0,39
120112B_61	0	306125	0,0056	100	222	202	0,1253	0,0005	6,310	0,128	0,365	0,007	0,98	99	2034	7	2020	18	2007	34	2,73848658 7	2,00	0,12533388 4	0,39
120112B_62	0	133316	0,0129	38	42	93	0,1172	0,0006	5,597	0,114	0,346	0,007	0,97	100	1914	9	1916	17	1917	33	2,88782775 1	2,01	0,11723507 8	0,48
120112B_63	0	170198	0,0101	46	28	118	0,1183	0,0005	5,688	0,116	0,349	0,007	0,97	100	1931	8	1930	17	1928	33	2,86854950 6	2,01	0,11834098 9	0,45
120112B_64	inclusions	477656	0,0036	141	214	398	0,1224	0,0005	4,885	0,099	0,290	0,006	0,98	82	1991	7	1800	17	1639	29	3,45345141 5	2,00	0,12235315 1	0,38
120112B_65	0	491430	0,0035	142	55	241	0,2006	0,0007	13,608	0,275	0,492	0,010	0,98	91	2831	6	2723	19	2579	42	2,03281328 7	2,00	0,20062751 3	0,37
120112B_66	0	183363	0,0094	60	127	132	0,1146	0,0005	5,292	0,108	0,335	0,007	0,98	99	1874	8	1868	17	1862	32	2,98673693 7	2,01	0,11463625	0,43
120112B_67	0	1436	1,1990	28	23	96	0,1082	0,0006	3,720	0,077	0,249	0,005	0,96	81	1770	11	1576	16	1434	26	4,01264107 2	2,01	0,10824990 3	0,59

Appendix 3(16) U-Pb analyses.

120112B_68	inclusions	493736	0,0035	129	27	324	0,1219	0,0005	6,181	0,126	0,368	0,007	0,98	102	1984	8	2002	18	2019	35	2,71914719 6	2,01	0,12188904 3	0,43
120112B_69	0	268503	0,0064	72	40	181	0,1164	0,0005	5,754	0,117	0,358	0,007	0,98	104	1902	7	1939	17	1974	34	2,79035312 8	2,01	0,11644024 4	0,42
120112B_70	0	120669	0,0143	36	56	83	0,1186	0,0006	5,717	0,117	0,350	0,007	0,97	100	1936	9	1934	18	1932	33	2,86098246 1	2,01	0,11863664 3	0,50
120112B_71	0	1099618	0,0016	371	926	735	0,1222	0,0004	6,082	0,123	0,361	0,007	0,98	100	1989	6	1988	17	1986	34	2,77128905 2	2,00	0,12223880 6	0,36
120112B_72	0	80765	0,0213	23	25	56	0,1187	0,0007	5,738	0,118	0,351	0,007	0,96	100	1937	10	1937	18	1938	34	2,85176529 7	2,01	0,11868832 2	0,57
120112B_73	0	187967	0,0092	52	49	130	0,1173	0,0005	5,654	0,115	0,350	0,007	0,98	101	1915	8	1924	17	1933	33	2,86012744 7	2,01	0,11727435 4	0,44
120112B_74	0	187385	0,0092	51	33	131	0,1169	0,0006	5,549	0,114	0,344	0,007	0,97	100	1909	9	1908	18	1907	33	2,90425575 4	2,01	0,11687938 2	0,53
120112B_75	0	91850	0,0187	26	29	74	0,1168	0,0007	4,800	0,099	0,298	0,006	0,96	88	1908	10	1785	17	1681	30	3,35625656 8	2,01	0,11683071 9	0,56
120112B_76	0	451358	0,0038	118	39	314	0,1175	0,0005	5,625	0,115	0,347	0,007	0,97	100	1919	8	1920	17	1921	33	2,88103732 1	2,01	0,11753013 4	0,45
120112B_77	0	411947	0,0042	122	145	285	0,1182	0,0005	5,679	0,115	0,348	0,007	0,98	100	1929	8	1928	17	1927	33	2,86997842 6	2,01	0,11820878 8	0,43
120112B_78	inclusions	266868	0,0065	81	60	144	0,1795	0,0007	11,110	0,225	0,449	0,009	0,98	90	2648	7	2532	19	2391	40	2,22740812 5	2,01	0,17947962 6	0,39
120112B_79	0	44063	0,0391	13	17	31	0,1182	0,0008	5,679	0,118	0,348	0,007	0,95	100	1930	12	1928	18	1927	34	2,87022690 5	2,02	0,11822841 4	0,65
120112B_80	0	212597	0,0081	59	53	141	0,1252	0,0006	6,282	0,128	0,364	0,007	0,97	99	2031	8	2016	18	2001	34	2,74758933 8	2,01	0,12517799	0,47
120112B_81	0	365358	0,0047	126	126	134	0,2618	0,0010	23,727	0,480	0,657	0,013	0,98	100	3258	6	3257	20	3256	51	1,52153843 4	2,01	0,26183257 7	0,37
120112B_82	0	232166	0,0074	75	168	163	0,1167	0,0005	5,537	0,113	0,344	0,007	0,98	100	1907	8	1906	17	1906	33	2,90635981 6	2,01	0,11671812 6	0,44
120112B_83	0	74124	0,0232	21	20	52	0,1173	0,0007	5,597	0,116	0,346	0,007	0,96	100	1915	11	1916	18	1916	33	2,8890906	2,01	0,11727844 3	0,59
120112B_84	0	481842	0,0036	147	54	245	0,2672	0,0010	17,509	0,354	0,475	0,010	0,98	76	3290	6	2963	19	2506	41	2,10429890 2	2,00	0,26722135 7	0,37
120112B_85	inclusions	245146	0,0070	67	38	201	0,1175	0,0005	4,776	0,097	0,295	0,006	0,98	87	1918	7	1781	17	1666	29	3,39179974 3	2,01	0,11748059 1	0,42
120112B_86	0	428484	0,0040	126	180	326	0,1171	0,0005	5,129	0,104	0,318	0,006	0,98	93	1912	7	1841	17	1779	31	3,14730490 1	2,00	0,11706868 6	0,39
120112B_87	0	217374	0,0079	65	81	147	0,1208	0,0006	5,942	0,122	0,357	0,007	0,97	100	1968	9	1967	18	1967	34	2,80340584 3	2,01	0,12080743 7	0,49
120112B_88	0	167853	0,0103	56	72	74	0,1986	0,0009	14,944	0,304	0,546	0,011	0,98	100	2815	7	2812	19	2808	46	1,83219073 8	2,01	0,19858172 9	0,45
120112B_89	0	93748	0,0184	29	32	46	0,1764	0,0008	12,105	0,247	0,498	0,010	0,97	99	2620	8	2613	19	2603	43	2,00976058 7	2,01	0,17643958 6	0,47
120112B_90	0	175477	0,0098	65	189	115	0,1250	0,0006	6,365	0,130	0,369	0,007	0,97	100	2029	9	2027	18	2026	35	2,70824561 8	2,01	0,12502316 2	0,49
120112B_91	0	215291	0,0080	64	107	151	0,1174	0,0005	5,581	0,114	0,345	0,007	0,98	100	1917	8	1913	17	1910	33	2,89948274 8	2,01	0,11737160 4	0,45
120112B_92	0	342368	0,0050	103	168	240	0,1172	0,0005	5,585	0,114	0,346	0,007	0,98	100	1914	8	1914	17	1914	33	2,89298716 5	2,01	0,11718896 3	0,43
120112B_93	0	113539	0,0152	34	22	55	0,1887	0,0010	12,907	0,265	0,496	0,010	0,97	95	2731	9	2673	19	2597	43	2,01576810 4	2,01	0,18870123 8	0,53
120112B_94	inclusions	208184	0,0083	66	113	158	0,1237	0,0006	5,430	0,111	0,318	0,006	0,97	89	2010	9	1890	17	1782	31	3,14054072 2	2,01	0,12367185	0,49
120112B_95	0	119195	0,0144	33	26	79	0,1240	0,0007	6,218	0,128	0,364	0,007	0,97	99	2015	9	2007	18	1999	34	2,75034488 3	2,01	0,12404082 7	0,53
120112B_96	0	85064	0,0202	28	34	47	0,1864	0,0010	11,162	0,229	0,434	0,009	0,97	86	2710	9	2537	19	2326	39	2,30201499 2	2,01	0,18636629 5	0,53
120112B_97	0	247011	0,0070	76	128	176	0,1159	0,0006	5,429	0,111	0,340	0,007	0,97	100	1894	9	1889	17	1885	33	2,94392760 6	2,01	0,11592218 6	0,50
120112B_98	0	282354	0,0061	87	143	189	0,1196	0,0006	5,954	0,122	0,361	0,007	0,97	102	1951	8	1969	18	1987	34	2,77063698	2,01	0,11963423 3	0,47
120112B_99	0	115945	0,0148	33	34	77	0,1233	0,0006	6,203	0,127	0,365	0,007	0,97	100	2004	9	2005	18	2005	35	2,74025714 4	2,01	0,12327492 4	0,50
120112B_100	0	315793	0,0055	88	78	224	0,1159	0,0005	5,459	0,111	0,342	0,007	0,98	100	1893	7	1894	17	1895	33	2,92630096 8	2,01	0,11586549 2	0,41
120112B_101	inclusions	102720	0,0168	29	29	99	0,1176	0,0007	4,063	0,084	0,251	0,005	0,95	75	1920	11	1647	17	1442	26	3,99020234 6	2,01	0,11759390 6	0,63

Appendix 3(17) U-Pb analyses.

				Pb	Th	U									Derived ages and errors						T-W (Pbc corrected)			
Sample	Comment	Pb206/Pb204	206Pbc(%)	ppm			207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	r	% Concordance	207Pb/206Pb	1s	207Pb/235U	1s	206Pb/238U	1s	238U/206Pb	1s %	207Pb/206Pb	1s %
120112C_01	0	380134	0,0045	105	153	249	0,1174	0,0004	5,586	0,113	0,345	0,007	0,98	100	1917	6	1914	17	1911	33	2,89729514	2,00	0,117381972	0,36
120112C_02	0	133937	0,0129	37	45	86	0,1189	0,0006	5,795	0,119	0,354	0,007	0,97	101	1939	9	1946	18	1952	34	2,828259262	2,01	0,118877495	0,52
120112C_03	0	969792	0,0018	277	82	370	0,2729	0,0009	22,363	0,450	0,594	0,012	0,99	90	3323	5	3200	19	3007	48	1,682525668	2,00	0,272892737	0,32
120112C_04	0	97313	0,0177	27	16	41	0,1922	0,0008	14,116	0,287	0,533	0,011	0,98	100	2761	7	2758	19	2753	45	1,87733053	2,01	0,192192872	0,42
120112C_05	0	409192	0,0042	109	82	231	0,1361	0,0005	7,530	0,152	0,401	0,008	0,98	100	2178	6	2177	18	2175	37	2,492048879	2,00	0,136097897	0,35
120112C_06a	inclusions	498744	0,0035	139	92	220	0,1742	0,0006	12,356	0,249	0,514	0,010	0,99	103	2599	5	2632	19	2675	44	1,944201651	2,00	0,174227738	0,33
120112C_06b	0	413560	0,0042	100	11	268	0,1181	0,0005	5,701	0,115	0,350	0,007	0,98	100	1927	7	1932	17	1936	33	2,855464036	2,00	0,118076059	0,38
120112C_07	0	185920	0,0093	55	100	141	0,1207	0,0005	4,957	0,101	0,298	0,006	0,98	86	1966	8	1812	17	1681	30	3,355941508	2,01	0,120659537	0,43
120112C_08	0	365525	0,0047	106	203	239	0,1170	0,0004	5,586	0,113	0,346	0,007	0,99	100	1911	6	1914	17	1916	33	2,888577843	2,00	0,117034642	0,35
120112C_09	0	21880	0,0787	6	4	16	0,1140	0,0010	4,830	0,104	0,307	0,006	0,92	93	1864	15	1790	18	1728	31	3,253897355	2,03	0,113990105	0,86
120112C_10	0	296640	0,0058	92	166	142	0,1847	0,0006	12,026	0,243	0,472	0,009	0,99	93	2695	6	2606	19	2494	41	2,117227856	2,00	0,184663898	0,34
120112C_11	0	510280	0,0034	138	146	317	0,1218	0,0004	6,130	0,124	0,365	0,007	0,98	101	1983	6	1995	17	2006	34	2,739908197	2,00	0,121822157	0,35
120112C_12	0	540470	0,0032	132	24	357	0,1168	0,0004	5,533	0,112	0,344	0,007	0,98	100	1907	6	1906	17	1904	33	2,910049716	2,00	0,116773754	0,36
120112C_13a	0	551043	0,0031	154	212	329	0,1262	0,0004	6,608	0,133	0,380	0,008	0,99	101	2046	6	2060	18	2075	35	2,633606277	2,00	0,126208842	0,33
120112C_13b	short	420151	0,0041	104	37	274	0,1170	0,0006	5,604	0,115	0,347	0,007	0,96	101	1910	10	1917	18	1923	33	2,877773613	2,01	0,116973219	0,54
120112C_14	0	251174	0,0069	66	55	164	0,1179	0,0005	5,655	0,115	0,348	0,007	0,98	100	1924	8	1924	17	1925	33	2,874251743	2,01	0,117877665	0,44
120112C_15	0	1796	0,9587	32	30	79	0,1098	0,0006	5,202	0,107	0,344	0,007	0,97	106	1796	9	1853	17	1904	33	2,91028537	2,01	0,10980901	0,51
120112C_16	0	102735	0,0168	29	46	68	0,1166	0,0006	5,516	0,113	0,343	0,007	0,97	100	1905	9	1903	17	1902	33	2,914390306	2,01	0,116588322	0,50
120112C_17	0	540249	0,0032	140	105	345	0,1177	0,0004	5,765	0,117	0,355	0,007	0,98	102	1921	7	1941	17	1960	34	2,814658367	2,00	0,117685085	0,38
120112C_18	short	1400202	0,0012	362	284	888	0,1151	0,0004	5,678	0,115	0,358	0,007	0,98	105	1881	7	1928	17	1972	34	2,794067324	2,00	0,115057915	0,37
120112C_19	0	430450	0,0040	111	8	186	0,1880	0,0007	13,616	0,275	0,525	0,011	0,98	100	2725	6	2723	19	2721	44	1,903954842	2,00	0,188018182	0,35
120112C_20	0	303295	0,0057	80	63	207	0,1256	0,0005	5,767	0,117	0,333	0,007	0,98	91	2037	6	1942	17	1853	32	3,00285025	2,00	0,125606686	0,36
120112C_21	0	222699	0,0077	64	94	140	0,1225	0,0006	6,105	0,125	0,362	0,007	0,97	100	1993	9	1991	18	1989	34	2,766176384	2,01	0,122469877	0,50
120112C_22	0	177454	0,0097	51	78	111	0,1229	0,0006	6,139	0,125	0,362	0,007	0,97	100	1998	8	1996	18	1993	34	2,759571837	2,01	0,122869319	0,47
120112C_23	0	830982	0,0021	218	241	618	0,1202	0,0004	5,056	0,102	0,305	0,006	0,98	88	1959	6	1829	17	1717	30	3,277527175	2,00	0,120181727	0,35
120112C_24	short	318654	0,0054	84	67	205	0,1222	0,0007	5,933	0,122	0,352	0,007	0,96	98	1988	10	1966	18	1945	34	2,839651011	2,01	0,122188196	0,56
120112C_25	0	719081	0,0024	214	289	349	0,1599	0,0005	10,318	0,208	0,468	0,009	0,99	101	2455	6	2464	19	2475	41	2,136655693	2,00	0,159895215	0,34
120112C_26	0	269095	0,0064	70	56	169	0,1204	0,0006	5,988	0,122	0,361	0,007	0,97	101	1962	8	1974	18	1986	34	2,77237215	2,01	0,12039735	0,46
120112C_27	0	281254	0,0061	73	72	205	0,1176	0,0005	5,046	0,102	0,311	0,006	0,98	91	1921	7	1827	17	1746	31	3,214380036	2,01	0,117640555	0,41
120112C_28	0	292093	0,0059	82	122	176	0,1145	0,0005	5,935	0,121	0,376	0,008	0,98	110	1871	8	1966	18	2058	35	2,659062639	2,01	0,114464864	0,44
120112C_29	0	247011	0,0070	62	29	162	0,1175	0,0004	5,602	0,113	0,346	0,007	0,98	100	1919	7	1916	17	1914	33	2,892923158	2,00	0,117543769	0,38
120112C_30	0	579182	0,0030	173	313	342	0,1299	0,0005	6,885	0,139	0,384	0,008	0,98	100	2097	6	2097	18	2096	36	2,602322909	2,00	0,129945382	0,36
120112C_31	0	149977	0,0115	42	60	95	0,1222	0,0005	6,051	0,123	0,359	0,007	0,98	100	1988	8	1983	18	1978	34	2,7840395	2,01	0,122170519	0,43
120112C_32	0	386042	0,0045	109	81	173	0,1795	0,0006	12,571	0,254	0,508	0,010	0,98	100	2648	6	2648	19	2648	43	1,968757658	2,00	0,179500342	0,36
120112C_33	0	95233	0,0181	27	42	56	0,1299	0,0006	6,882	0,141	0,384	0,008	0,97	100	2097	9	2096	18	2096	36	2,602947624	2,01	0,129915299	0,49
120112C_34	0	9052	0,1902	175	207	266	0,1764	0,0006	12,027	0,243	0,495	0,010	0,99	99	2619	6	2607	19	2591	43	2,021829017	2,00	0,176365856	0,33
120112C_35	0	330372	0,0052	102	213	199	0,1274	0,0005	6,622	0,134	0,377	0,008	0,98	100	2062	7	2062	18	2062	35	2,65223465	2,01	0,127384545	0,40
120112C_36	inclusions	4962	0,3469	136	876	1112	0,0841	0,0003	1,126	0,023	0,097	0,002	0,98	46	1295	7	766	11	598	11	10,29629296	2,00	0,084118409	0,36
120112C_37	0	262064	0,0066	82	192	159	0,1264	0,0005	6,523	0,133	0,374	0,008	0,98	100	2049	8	2049	18	2049	35	2,672475421	2,01	0,126438917	0,43
120112C_38	0	122899	0,0140	38	46	52	0,1939	0,0008	14,365	0,292	0,537	0,011	0,98	100	2776	7	2774	19	2772	45	1,861151967	2,01	0,193908786	0,41
120112C_39	0	221995	0,0078	60	68	144	0,1191	0,0005	5,757	0,117	0,351	0,007	0,98	100	1942	7	1940	17	1938	33	2,851907739	2,01	0,119079122	0,42
120112C_40	short	522877	0,0033	137	102	320	0,1220	0,0005	6,252	0,127	0,372	0,007	0,98	103	1986	7	2012	18	2037	35	2,691192138	2,01	0,122025525	0,40
120112C_41	0	171826	0,0100	46	47	104	0,1264	0,0006	6,565	0,134	0,377	0,008	0,98	101	2049	8	2055	18	2061	35	2,65468951	2,01	0,126405904	0,45
120112C_42	0	118737	0,0145	39	98	76	0,1295	0,0006	6,379	0,130	0,357	0,007	0,98	94	2092	8	2029	18	1969	34	2,799874198	2,01	0,129532242	0,45
120112C_43	0	2772	0,6211	60	80	140	0,1131	0,0005	5,470	0,112	0,351	0,007	0,97	105	1850	9	1896	17	1938	34	2,851748238	2,01	0,113142741	0,48
120112C_44	0	255076	0,0067	70	45	115	0,1845	0,0007	12,806	0,259	0,503	0,010	0,98	98	2694	6	2666	19	2628	43	1,986633325	2,01	0,184518459	0,38
120112C_45	0	95549	0,0180	30	65	56	0,1312	0,0007	7,000	0,143	0,387	0,008	0,97	100	2115	9	2111	18	2108	36	2,585053938	2,01	0,131242137	0,50
120112C_46	0	49802	0,0346	14	26	41	0,1163	0,0007	4,411	0,091	0,275	0,006	0,96	82	1900	11	1714	17	1567	28	3,634304798	2,01	0,116275956	0,61
120112C_47	0	172197	0,0100	47	23	81	0,1871	0,0007	12,519	0,254	0,485	0,010	0,98	94	2717	7	2644	19	2550	42	2,060843248	2,01	0,187113674	0,40
120112C_48	0	162196	0,0106	43	41	107	0,1163	0,0006	5,510	0,113	0,344	0,007	0,97	100	1900	9	1902	17	1904	33	2,910771836	2,01	0,116313926	0,51
120112C_49	0	304076	0,0057	75	18	198	0,1176	0,0005	5,659	0,115	0,349	0,007	0,98	100	1921	7	1925	17	1929	33	2,866588823	2,00	0,117645629	0,38
120112C_50	0	227771	0,0076	67	138	151	0,1185	0,0005	5,605	0,114	0,343	0,007	0,98	98	1933	7	1917	17	1902	33	2,914343368	2,01	0,118470093	0,41
120112C_51	0	64593	0,0267	18	30	43	0,1247	0,0007	5,876	0,121	0,342	0,007	0,96	94	2024	10	1958	18	1895	33	2,925658054	2,01	0,124671512	0,55
120112C_52	0	168060	0,0102	49	100	112	0,1163	0,0005	5,492	0,112	0,342	0,007	0,98	100	1901	8	1899	17	1898	33	2,920615065	2,01	0,116335033	0,45
120112C_53	0	369094	0,0047	94	54	237	0,1201	0,0005	5,873	0,119	0,355	0,007	0,98	100	1958	7	1957	17	1957	34	2,819577072	2,01	0,120097642	0,42
120112C_54	0	661731	0,0026	199	119	230	0,2612	0,0009	23,651	0,478	0,657	0,013	0,98	100	3254	6	3254	20	3254	51	1,523004708	2,01	0,261247886	0,36
120112C_55	0	815386	0,0021	232	283	428	0,1446	0,0005	8,656	0,175	0,434	0,009	0,98	102	2284	6	2302	18	2324	39	2,304005783	2,00	0,144647021	0,36
120112C_56	0	6752	0,2550	132	96	331	0,1179	0,0005	5,738	0,116	0,353	0,007	0,98	101	1925	7	1937	17	1949	33	2,832839218	2,00	0,117891801	0,39
120112C_57	0	519088	0,0033	139	143	324	0,1233	0,0004	6,209	0,126	0,365	0,007	0,98	100	2004	6	2006	18	2007	34	2,737312567	2,00	0,123267903	0,36
120112C_58	0	487780	0,0035	136	181	310	0,1199	0,0005	5,939	0,120	0,359	0,007	0,98	101	1955	7	1967	17	1978	34	2,784611203	2,00	0,119938048	0,39
120112C_59	0	326328	0,0053	93	140	236	0,1282	0,0005	5,582	0,113	0,316	0,006	0,98	85	2074	7	1913	17	1768	31	3,168053804	2,00	0,128249088	0,39
120112C_60	short	992970	0,0017	313	689	587	0,1238	0,0005	6,581	0,133	0,385	0,008	0,98	104	2012	7	2057	18	2101	36	2,594754022	2,00	0,123838923	0,37
120112C_61	0	379995	0,0045	98	80	253	0,1163	0,0004	5,486	0,111	0,342	0,007	0,98	100	1901	7	1898	17	1897	33	2,923360565	2,00	0,116325877	0,38
120112C_62	0	398654	0,0043	97	16	261	0,1182	0,0004	5,686	0,115	0,349	0,007	0,98	100	1929	7	1929	17	1929	33	2,866213886	2,00	0,118205032	0,37
120112C_63	0	284186	0,0061	81	117	179	0,1184	0,0005	5,915	0,121	0,362	0,007	0,98	103	1933	8	1963	18	1993	34	2,760397402	2,01	0,118423649	0,45
120112C_64	0	185483	0,0093	50	41	97	0,1417	0,0007	8,483	0,174	0,434	0,009	0,97	103	2248	9	2284	18	2324	39	2,303566628	2,01	0,141731583	0,52
120112C_65	0	343723	0,0050	87	42	235	0,1157	0,0005	5,323	0,108	0,334	0,007	0,98	98	1890	7	1873	17	1857	32	2,996112287	2,00	0,115669975	0,39
120112C_66a	0	1226514	0,0014	391	756	610	0,1601	0,0005	10,126	0,204	0,459	0,009	0,99	99	2457	6	2446	18	2434	40	2,179779426	2,00	0,160087999	0,34
120112C_66b	0	412841	0,0042	101	38	298	0,1180	0,0005	5,151	0,105	0,317	0,006	0,98	92	1926	7	1845	17	1773	31	3,158702176	2,00	0,11801524	0,40

Appendix 3(18) U-Pb analyses.

120112C_67	0	484693	0,0036	128	113	347	0,1162	0,0005	5,114	0,104	0,319	0,006	0,98	94	1899	7	1838	17	1785	31	3,133869695	2,00	0,116234181	0,39
120112C_68	0	107316	0,0160	30	17	42	0,2158	0,0011	17,299	0,355	0,581	0,012	0,97	100	2950	8	2952	19	2954	48	1,719961514	2,02	0,21578745	0,51
120112C_69	0	236893	0,0073	63	63	157	0,1166	0,0005	5,520	0,113	0,343	0,007	0,97	100	1905	8	1904	17	1903	33	2,912205991	2,01	0,116588231	0,47
120112C_70	0	543437	0,0032	134	41	360	0,1177	0,0004	5,601	0,113	0,345	0,007	0,98	99	1922	7	1916	17	1911	33	2,898334031	2,00	0,117740523	0,38
120112C_71	0	274897	0,0063	69	33	169	0,1253	0,0006	6,398	0,130	0,370	0,007	0,98	100	2033	8	2032	18	2031	35	2,700145679	2,01	0,125290082	0,44
120112C_72	0	424064	0,0041	105	37	282	0,1174	0,0005	5,561	0,113	0,344	0,007	0,98	99	1917	7	1910	17	1904	33	2,910478207	2,00	0,117391763	0,40
120112C_73	0	383929	0,0045	100	99	255	0,1166	0,0005	5,519	0,112	0,343	0,007	0,98	100	1905	7	1904	17	1902	33	2,914056489	2,00	0,116636515	0,40
120112C_74	0	398387	0,0043	107	64	190	0,1537	0,0006	10,135	0,206	0,478	0,010	0,98	106	2388	7	2447	19	2519	42	2,091211838	2,01	0,153709556	0,40
120112C_75	0	483592	0,0036	135	87	206	0,1929	0,0007	14,232	0,288	0,535	0,011	0,98	100	2767	6	2765	19	2763	45	1,868478371	2,00	0,192871451	0,37
120112C_76	0	622368	0,0028	169	87	288	0,1827	0,0007	12,430	0,251	0,493	0,010	0,98	97	2678	6	2637	19	2585	43	2,026686647	2,00	0,182704129	0,36
120112C_77	0	533233	0,0032	151	298	508	0,1106	0,0005	3,658	0,074	0,240	0,005	0,98	77	1809	7	1562	16	1387	25	4,167208877	2,00	0,110553968	0,41
120112C_78	step in ratio	95297	0,0181	27	17	37	0,2048	0,0010	16,724	0,342	0,592	0,012	0,97	105	2865	8	2919	19	2999	48	1,688159846	2,01	0,204760543	0,47
120112C_79	inclusions	578402	0,0030	146	56	348	0,1170	0,0005	6,133	0,125	0,380	0,008	0,98	109	1912	8	1995	18	2076	36	2,631425488	2,01	0,117048024	0,43
120112C_80	0	109471	0,0157	32	55	68	0,1299	0,0006	6,580	0,134	0,367	0,007	0,97	96	2097	8	2057	18	2017	35	2,722549325	2,01	0,129925325	0,48
120112C_81	0	1961	0,8778	52	161	93	0,1202	0,0006	5,914	0,121	0,357	0,007	0,97	100	1959	8	1963	18	1968	34	2,801588334	2,01	0,120162824	0,47
120112C_82	0	683051	0,0025	222	330	295	0,1852	0,0007	13,502	0,274	0,529	0,011	0,98	101	2700	6	2715	19	2736	45	1,891051949	2,00	0,18518293	0,39
120112C_83	0	133192	0,0129	37	54	86	0,1198	0,0006	5,816	0,119	0,352	0,007	0,97	100	1953	8	1949	18	1945	34	2,839460795	2,01	0,11976762	0,47
120112C_84	0	937742	0,0018	240	136	570	0,1261	0,0005	6,535	0,132	0,376	0,008	0,98	101	2044	7	2051	18	2057	35	2,65990152	2,00	0,126064248	0,38
120112C_85	0	391294	0,0044	114	109	182	0,1780	0,0007	12,054	0,244	0,491	0,010	0,98	98	2635	6	2609	19	2575	42	2,036603337	2,00	0,178046209	0,39
120112C_86	0	280897	0,0061	77	136	285	0,1113	0,0005	3,459	0,070	0,225	0,005	0,98	72	1821	8	1518	16	1310	24	4,437645631	2,01	0,111335105	0,42
120112C_87	short	544844	0,0032	163	325	344	0,1268	0,0005	6,342	0,129	0,363	0,007	0,98	97	2055	8	2024	18	1995	34	2,757659994	2,01	0,126839599	0,43
120112C_88	0	257284	0,0067	72	100	166	0,1191	0,0005	5,832	0,119	0,355	0,007	0,97	101	1943	8	1951	18	1959	34	2,816567465	2,01	0,119143286	0,46
120112C_89	0	187504	0,0092	47	24	123	0,1186	0,0005	5,708	0,116	0,349	0,007	0,98	100	1935	8	1933	17	1930	33	2,864211364	2,01	0,118580878	0,45
120112C_90	0	147219	0,0117	41	46	89	0,1273	0,0006	6,623	0,136	0,377	0,008	0,97	100	2061	9	2062	18	2064	35	2,650074456	2,01	0,127302205	0,50
120112C_91	0	344854	0,0050	97	133	225	0,1200	0,0005	5,811	0,118	0,351	0,007	0,98	99	1956	7	1948	17	1941	34	2,846853221	2,00	0,119982197	0,40
120112C_92	0	209642	0,0082	57	55	116	0,1275	0,0007	7,255	0,149	0,413	0,008	0,97	108	2063	9	2143	18	2228	38	2,422454637	2,01	0,127464403	0,53
120112C_93	0	102058	0,0169	28	40	69	0,1163	0,0006	5,434	0,111	0,339	0,007	0,97	99	1900	9	1890	17	1881	33	2,950574478	2,01	0,116275186	0,51
120112C_94	0	168806	0,0102	44	40	111	0,1172	0,0005	5,623	0,115	0,348	0,007	0,98	101	1915	8	1920	17	1924	33	2,874526691	2,01	0,117235546	0,45
120112C_95	0	105633	0,0163	29	37	70	0,1169	0,0006	5,595	0,115	0,347	0,007	0,96	101	1910	10	1915	18	1920	33	2,881950337	2,01	0,116945906	0,55
120112C_96	0	298943	0,0058	78	64	192	0,1178	0,0005	5,801	0,118	0,357	0,007	0,98	102	1923	8	1947	17	1968	34	2,800598645	2,01	0,117824912	0,44
120112C_97	0	235563	0,0073	63	57	147	0,1235	0,0006	6,260	0,128	0,368	0,007	0,97	101	2007	9	2013	18	2018	35	2,720301088	2,01	0,12350652	0,49
120112C_98	0	176153	0,0098	49	63	105	0,1293	0,0006	6,844	0,140	0,384	0,008	0,97	100	2088	8	2091	18	2095	36	2,604338357	2,01	0,129281595	0,48
120112C_99	0	494508	0,0035	122	37	320	0,1190	0,0005	5,804	0,118	0,354	0,007	0,98	101	1941	8	1947	17	1953	34	2,82629253	2,01	0,118980425	0,43
120112C_100	0	219911	0,0078	58	47	137	0,1230	0,0006	6,233	0,127	0,368	0,007	0,97	101	2000	8	2009	18	2018	35	2,720997023	2,01	0,122998183	0,46