

XRD Analysis of Crystal Structure of the Fragment of the Campo Del Cielo Meteorite

Maksimova E.M., *PhD*, Hontsova S.S., *student*;
Nauhatsky I.A., *head of the laboratory*
V.I. Vernadsky Crimean Federal University, Simferopol

Meteorites are the key, and often the only source of information about the pre-planetary and planetary early history of our solar system [1]. Currently, the following classification of meteorites: stone (aerolites) stoney-iron (siderolites) and iron (siderites), depending on the ratio of silicate minerals in them, and nickel-iron [2].

X-ray analysis was investigated of the fragment of iron meteorite Campo del Cielo, measuring 1.5 cm by 2 cm, weighing 13.55 grams. The crystal structure of the samples were examined for general purpose diffractometer «DRON-3» by powder method with copper radiation (Cu K α). Survey was carried out in the range of angles from 10° to 100°.

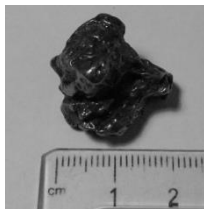


Figure 1 – Sample of meteorite.

It was found that the basis of the structure of meteorite Campo del Cielo is native iron of cosmic origin – a compound of minerals kamacite (Fe,Ni) and taenite (Fe, Ni). There are also the inclusions of minerals phase: troilite FeS, sphalerite ZnS, daubreelite FeCr₂S₄, alabandite MnS – group of sulphides; enstatite (Mg,Ca)SiO₃, hedenbergite CaFeSi₂O₆, pigeonite (Ca,Fe)₂Si₂O₆, olivine (Fe,Mg,Mn)₂SiO₄, plagioclase (Ca,Na)(Al,Si)[AlSi₂O₈] – silicate group; graphite C, chromite FeCr₂O₄, cohenite Fe₃C and schreibersite (Fe,Ni)₃P.

1. Dodd R.T. *Meteorites*: Trans. from English. (M.: Mir: 1986).
2. J.I. Goldstein et al., *Chemie der Erde*, 69, 293 (2009).