5273

Rb-Sr ISOTOPE DATA FOR CORE SAMPLES OF THE ICDP BOSUMTWI SCIENTIFIC DRILLING PROJECT, GHANA

S. Luetke[1, 2], A. Deutsch[1, 2], and A. Sokol[1]. [1]Institut für Planetologie, Universität Münster, Wilhelm-Klemm-Str.10, DE-48149 Muenster, Germany. [2]ZLG, Münster, Germany. E-mail: luetke.s@uni-muenster.de

Introduction: The 1.07 Ma old Bosumtwi impact structure, Ghana (06°32′N, 01°25′W) is a young and excellent preserved complex crater. As part of the Bosumtwi Core Drilling Project (BCDP) two cores were drilled into impactites (BCDP-7A: annular moat, BCDP-8A: central uplift). In contrast to the broad spectrum of target and impact lithologies found on the crater rim, the drill cores mainly consist of meta-greywackes, phyllites and impact breccias [1, 2]. The goal of this isotope study is to constrain the precursor lithologies of Bosumtwi-related impact glasses (Ivory Coast tektites [IVC] and microtektites).

Samples: We investigated 1) six breccias of cores 7A and 8A, 2) two meta-greywackes (7A), and 3) two shales (7A). (1) consist of mineral (mainly quartz, feldspar, and calcite) and lithic fragments (meta-greywacke and a variety of shales to phyllite) ranging in diameter from 0.1 to 10 cm. The fine grained matrix additionally contains sheet silicates. To estimate the influence of clasts to the whole rock isotope systematics different parts of breccias were separated, i.e., (i) domains exclusively consisting of matrix and clasts ≤0.5 cm, (ii) such with matrix and clasts mainly larger than 1 cm, and (iii) single large meta-greywacke clasts (≥5 cm). (2) one meta-greywacke is medium grained, the other one phyllitic; (3) the shales are grey to dark grey, very fine grained, and display a foliation; they have a powdery consistence.

Rb-Sr Isotope Data: The breccias from core 8A have $^{87}Sr/^{86}Sr$ ratios between 0.703350 ± 14 (2σ) and 0.708955 ± 12, those of core 7A higher values from 0.720310 ± 13 to 0.72581 ± 10. The breccia domains (i), (ii), and (iii) don't display large variation indicating the absence of not yet sampled target lithologies (e.g., granitoids) in the matrix. Two shales of 7A show much higher present day $^{87}Sr/^{86}Sr$ ratios (0.728310 ± 13 and 0.750205 ± 14) which is within the range published by [3] for shales, greywackes, and phyllites collected at the rim and in the vicinity of the crater. Reflecting the lower content of micas, greywackes of core 7A yield relatively low $^{87}Sr/^{86}Sr$ ratios (0.716423 ± 14 and 0.718968 ± 14), in accordance with our earlier results of core 8A [4]. Respective regression line calculations using the different lithologies result in rather low initial $^{87}Sr/^{86}Sr$ ratios of 0.7107 (7A) and 0.7027 (8A); the correspondent age values do not date a so far documented event, their geological relevance is questionable.

Outlook: The current set of isotope data does not allow to correlate specific target rocks with IVC. Therefore further isotope studies (Rb-Sr, Sm-Nd) as well as SEM analyses are in progress.

Acknowledgements: We appreciate support by DFG grant De 401/19. Skillful technical assistance was given by H. Baier, U. Heitmann, and V. Heinrich.

References: [1] Reimold W. U. et al. 2006. Abstract #1350. 37th Lunar and Planetary Science Conference. [2] Deutsch A. et al. 2006. Abstract #1292. 37th Lunar and Planetary Science Conference. [3] Koeberl C. et al. 1998. *Geochimica et Cosmochimica Acta* 62:2179–2196. [4] Luetke S. et al. 2006. Abstract #1811. 37th Lunar and Planetary Science Conference.

5287

ARGON AND NEON IN GENESIS ALUMINUM-COATED SAPPHIRE COLLECTORS FROM REGIME ARRAYS

J. C. Mabry[1], A. P. Meshik[1], C. M. Hohenberg[1], Y. Marrocchi[1], O. V. Pravdivtseva[1], J. Allton[2], R. Bastien[2], K. McNamara[3], E. Stansbery[3], and D. Burnett[4]. [1]Washington University, Physics Department, St. Louis, Missouri 63130, USA. E-mail: jcmabry@wustl.edu. [2]Lockheed Martin c/o NASA/JSC, Mail Code KT, Houston, Texas 77058, USA. [3]NASA/JSC, Mail Code KA, Houston, Texas 77058, USA. [4]Geology 100–23, Caltech, Pasadena, California 91125, USA

Introduction: Here we report Ar results from the aluminum on sapphire (AloS) bulk regime samples, from which Ne results were obtained [1]. Ar measurements from other regimes are in progress.

Table 1.

Regime	^{20}Ne fluence, $10^{12}/cm^2$	$^{20}Ne/^{22}Ne$	$^{21}Ne/^{22}Ne$
Bulk	1.23 ± .11	13.96 ± .03	.0346 ± .003
IS	.352 ± .032	13.98 ± .04	.0340 ± .004
CME	.271 ± .024	13.93 ± .04	.0336 ± .004
C-H	.362 ± .032	13.94 ± .04	.0345 ± .004

Method: Since elemental and isotopic abundances of light noble gases in solar wind differ substantially from terrestrial air (usually used for calibration), we used specially tailored calibration procedures. For Ar, we lowered the ion source emission to 50 μA, from our typical 150 μA. Using this procedure, mass discrimination was small and reproducible at less than 0.3%/amu.

The AloS samples were loaded into an extraction cell specially designed to minimize Al sputtering effects, which can contribute significantly to the blank and block the viewport. We rastered areas of 4, 10, 15, and 20 mm² for Ar and 1–2 mm² for Ne, using a Q-switched infrared laser, slightly defocused to optimize the surface energy density and the time needed to complete the raster. The corrections for $^{1}H^{35}Cl^{+}$ and $^{1}H^{37}Cl^{+}$ interferences at A = 36 and 38 were negligible, as was the ^{40}Ar blank (<5 × 10^{-10} ccSTP) with observed $^{40}Ar/^{36}Ar$ ratios between 3 and 10.

Ar fluences were calibrated using both an air standard and Springwater olivine grains (mg size), with known amounts of spallogenic ^{36}Ar, ^{38}Ar, ^{21}Ne, and ^{22}Ne [2]. These two calibrations differed by about 8%, which should improve by ongoing interlab calibrations.

Results: The Ar data from all four rastered areas formed a nearly perfect straight line when the ratios of $^{36}Ar/^{40}Ar$ versus $^{38}Ar/^{40}Ar$ were plotted, indicating a mixing of only two distinct components: solar wind and terrestrial atmosphere, no SEP or HCl effects. We calculated fluences (not corrected for backscatter) of (2.4 ± 0.2) × 10^{10} ^{36}Ar /cm^{-2} and (4.5 ± 0.4) × 10^{9} $^{38}Ar/cm^{-2}$. All four of our $^{36}Ar/^{38}Ar$ ratios agree to within 5 permil.

Table 2. $^{36}Ar/^{38}Ar$ ratios (from [3] and this work).

Terrestrial air	5.32
Apollo foils	5.3 ± 0.3
Lunar regolith (Zürich)	5.48 ± 0.05
Lunar regolith (Minnesota)	5.80 ± 0.06
SOHO/MTOF	5.5 ± 0.6
Regime bulk (this work, weighted average)	5.467 ± 0.010

Acknowledgements: Supported by NASA grants NNJO4HI17G and NAG5-12885.

References: [1] Hohenberg C. M. et al. 2006. Abstract #2439. 37th Lunar and Planetary Science Conference. [2] Megrue G. H. 1968. *Journal of Geophysical Research* 7:2027–2033. [3] Weins R. C. et al. 2004. *Earth and Planetary Science Letters* 222:697–712.