Geophysical Research Abstracts, Vol. 9, 09754, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-09754

Lake Bosumtwi impact crater: compositional peculiarities of fallback particles in ICDP core LB-05

S. Luetke (1), A. Deutsch (1), B. Kreher-Hartmann (2) and J. Berndt (3)

(1) Inst. f. Planetologie, U. Münster, D-48149 Muenster, Germany, (2) Inst. für Geowissenschaften, U. Jena, D-07749 Jena, (3) Inst. f. Mineralogie, U. Münster, D-48149 Muenster

(luetke.s@uni-muenster.de)

The 1.07 Ma Lake Bosumtwi impact crater, Ghana, is considered as the source of Ivory Coast tektites (IVC) and the associated microtektites found in deep-sea drill-cores in the Atlantic Ocean. Other glassy impact-lithologies occurring at the Bosumtwi impact structure are melt glass shards and diaplectic glasses in suevites, and the glassy fallback particles –mostly spheroids and subordinated shards, which were discovered in the uppermost impact deposits of the ICDP core LB-05A. Here we present electron microprobe analyses for these particles in comparison with the chemical composition of target and impact lithologies (ICDP cores LB-07A, and LB-08A; XRD analyses), IVC tektites, and microtektites (literature data). Compared to the wide range in silica contents, observed in Bosumtwi-related target and impact lithologies, all fallback particles with analytical totals close to 100 % fall in a relatively restricted range between 62.9 and 67.9 wt% SiO_2. The fallback glasses are generally depleted in Na_2O, an effect most probably caused by volatilization. The depletion in sodium, however, is more distinct in IVC, and microtektites, probably as corollary of the higher formation temperatures of both these glassy lithologies. Potassium shows a similar yet less pronounced trend of depletion in the three different glass types. Most distinct compositional differences between the glass types occur in MgO and CaO: IVC and microtektites contain in average more magnesium than the fallback particles of which most are moderately enriched compared to the average target composition; some particles, however, contain less MgO than this reference. Relative to the average target, the fallback glasses are all enriched in CaO up to a factor of 1.8, whilst IVC and microtektites are generally depleted in CaO. The observed differences are considered

as primary features of the glasses and may reflect (i) different precursor lithologies, and/or (ii) different pT conditions during their formation in the impact process. The formation of different glasses is still one of the not understood, and hence, most interesting topics in terrestrial cratering.