CHEMICAL CLASSIFICATION OF "SAU 300"

R. Bartoschewitz[1], R. Niedergesaess[2], R. Pepelnik[2], U. Reus[2], U. Kraehenbuehl[3], Th. Kurtz[4]. [1]Bartoschewitz Meteorite Lab, D-38518 Gifhorn. E-mail: Bartoschewitz.Meteorite-Lab@t-online.de. [2]GKSS Forschungszentrum GmbH, D-21502 Geesthacht. [3]Univ. Bern, CH-3000 Bern 9. [4]D-30459 Hannover.

The new lunar meteorite Sayh al Uhaymir 300 (SaU 300) is classified as regolithic granulite breccia due to its petrology and chemistry [1,2]. Whole rock analysis were done by ICPMS, TXRF and INAA at GKSS in Geesthacht and ICPMS at Bern University.

Fe vs. Mn: bulk chemistry of lunar rocks show a typical Fe/Mn-ratio (wt.-%) of about 70, and bulk Fe- and Mn-content increase from anothositic to basaltic rocks. For SaU 300 we found a ratio of 71.0 that plots in the upper field of anortositic lunar rocks.

Al_2O_3: Al is the main parameter to classifiy lunar rocks into anorthositic (Al_2O_3 25-35 wt.-%) and basaltic (8-12). With an Al_2O_3 content of 20.4-24.1 wt-% SaU 300 does neither meet the anortositic (LUN-A) nor the basaltic (LUN-B) rocks, reflecting an anorthosite with basaltic components. SaU 300 plots within the range of 10 further known lunar AB-mingled meteorites in the graphs FeO (6.6-8.0%), MgO/FeO (0,97-1.01), CaO/Al_2O_3 (CaO 13.2-13.7%), TiO_2 (0.26-0.27%) and Th (0.46 ppm) vs. Al_2O_3 [3, 4].

Sc: lunar highland rocks show a typical fraction line for Fe/Sc of about 4000, while the mare rocks plot on much lower ratios [5]. The Sc content of SaU 300 is 18-22 ppm, reflecting a Fe/Sc ratio of 3000-3500.

REE: Eu content of lunar rocks usually show within the CI-normalized REE trend positive anomaly for highland and negative for mare rocks. SaU 300 has a weak CI-normalized positive Eu anomaly (Eu/Sm 1.51; Eu/Gd 1.56) comparable to the anorthositic regolith breccia Y791197.

Ti/Sm vs. Mg#: lunar highland rocks are classified in ferroan anortisitic suite (FAN), high magnesian suite (HMS) and KREEP due to their Ti, Sm, Mg, and Fe-content [5]. SaU 300 (Ti 0.16 %; Sm 1.1 ppm; Mg# 0.65-0.69) plots in the gap between the FAN and HMS fields, like many other lunar meteorites. It is under discussion whether the FAN field has to be extended or if meteorites that plot in this gap are FAN-HMS mixtures [5].

Siderophile elements: SaU 300 is with Co 0.073, Ni 0.043, Ir 0.042, Au 0.047 (relative to CI) the most siderophile element enriched lunar meteorite [6], reflecting a rather high meteoritic component in this lunar rock.

Th/Sm: Korotev et al. [7] presented a $(Th/Sm)_{CI\text{-}norm}$ vs. Sm diagramm for various lunar rocks. SaU 300 plots in the field of magnesian granulitic breccias.

Summery: The bulk chemistry of SaU 300 reflects to a lunar metamorphic anorthosite-rich highland regolith with basaltic and meteoritic components.

References: [1] Russell S. et al. 2005. *Meteoritics and Planetary Science 40*: The Meteoritical Bulletin 89: this issue. [2] Bartoschewitz R. et al. 2005. *Meteoritics and Planetary Science 40*: this issue. [3] Korotev R.L. et al. 2004. *35th Lunar and Planetary Science Conference*. no. 1416. [4] Korotev R.L. 2005. http://epsc.wustl.edu/admin/resources/meteorites/chemclass/chemclass.htm.[5] Cahill J.T. et al. 2004. *Meteoritics and Planetary Science* 39: 503-529. [6] Bishoff A. et al.1998. *Meteoritics and Planetary Science 33*: 1243-1257. [7] Korotev R.L. et al. 2001. 32nd *Lunar and Planetary Science Conference*. no. 1455.