DAR AL GANI 400: PETROLOGY AND GEOCHEMISTRY OF SOME MAJOR LITHOLOGIES. M. Bukovanska[1,2], G. Dobosi[3,4], F. Brandstätter[1], and G. Kurat[1]; [1]Naturhistorisches Museum, Postfach 417, A - 1014 Vienna, Austria; [2]National Museum, Vaclavske nam. 68, 115 79 Prague 1, Czech Republic; [3]Hungarian Academy of Sciences, Budaorsi ut 45, H-1112 Budapest, Hungary; [4]Memorial University of Newfoundland, St. John's, Newfoundland, Canada A1B 3X5.

Three small polished sections of Dar Al Gani 400, the largest lunar meteorite found in 1998 in the Libyan desert [1,2], were available for petrologic and microchemical studies. The rock is a dense impact melt breccia with a plagioclase-rich, sub-ophitic matrix, abundant plagioclase clasts, a few olivine and pyroxene clasts and rare melt rock and hornfelsic breccia clasts. Two hornfelsic (granulitic) textures are present: 1) anorthite laths with interstitial olivine and pyroxene, no metals and troilite. 2) Pyroxene more frequent than olivine between anorthite laths, metals are common and occur in clusters associated with some troilite.

Plagioclases (and plagioclase shock glasses) are always pure anorthite with $Ab_{2.4-4.5}$ and $Or_{0.1-0.2}$ independent of their petrographic setting. FeO contents range from 0.18 to 0.48 wt%, MgO from 0.6 to 0.19 wt%. Olivine clasts are common and zoned from typically Fa_{15-17} to Fa_{30-40}. They are rich in minor elements such as TiO_2 (0-0.1 wt%), Al_2O_3 (0.06-0.36), Cr_2O_3 (0.04-0.14), MnO (0.15-0.46), and CaO (0.13-0.59). The MnO contents are correlated with the FeO content maintaining a constant FeO/MnO ratio of about 100. Low-Ca pyroxenes are common, range in composition from $En_{67}Fs_{31}Wo_{2.5}$ to $En_{50}Fs_{48}Wo_{2.4}$ and have low contents of TiO_2 (0.25 wt%), Al_2O_3 (0.6), Cr_2O_3 (0.25) and MnO (0.29-0.54 wt%). Pigeonitic pyroxenes of the melt rock groundmass cover about the same Fe/Mg range and commonly have high contents of Al_2O_3 (about 10 wt%) and TiO_2 (0.5-1 wt%).Ca-rich pyroxenes cluster around $En_{37}Fs_{22}Wo_{41}$, are poor in TiO_2 (0.6-1.1 wt%), Al_2O_3 (1-1.6), Cr_2O_3 (0.34-0.46) and MnO (0.21-0.3 wt%) but contain some Na2O (0-0.07 wt%). Clinopyroxene with opx exsolution lamellae ($Fs_{34-52}Wo_{1-2}$) are rare. Metal has varying Ni contents with typical compositions like $Ni_{24}Co_{1.1}$ and $Ni_{11}Co_{1.1}$ (wt%). Other accessory phases are Al-spinel, silica, chromite, and ilmenite. Secondary carbonate veins criss-cross the sample.

Orgueil-normalized trace element contents of impact melt breccias as determined by laser ablation ICP-MS following the procedures of [3,4] are shown in the Figure. Although abundances vary somewhat, they are fairly similar in most rocks, except for one which is richer in plagioclase than the rest. The trace element abundances are typical for lunar highland breccias, except for the high abundances of Ba and U which must be considered to be due to terrestrial contamination, similar to what has been seen before [1,2].

Dar Al Gani 400 is a meltrock breccia from the lunar highlands and is similar to Dar Al Gani 262, but not paired with it [5]. The rock is dense and poor in lithic clasts but carries abundant mineral clasts, mainly anorthite, a few large olivines and some pyroxenes, some of which have exsolution lamellae. The chemical composition of the phases indicates dominant source rocks of ferroan anorthositic affinity with small contributions from the Mg-suite, such as troctolitic and noritic rocks. The large olivine clasts have partially exchanged Mg for Fe with the ferroan impact melt indicating a short duration of the high temperature event. The abundant metal is mainly of primitive meteoritic heritage (Ni/Co ~ 22). No indication for a contribution from a basaltic or kreepy source could be found in our sample.

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