NORTHWEST AFRICA (NWA) 5073 – AN EUCRITIC BASALT WITH CM-SIZED PYROXENES. J. Roszjar[1], K. Metzler[1], A. Bischoff[1], R. C. Greenwood[2], and I. A. Franchi[2] [1]Institut für Planetologie, WWU Münster, Wilhelm-Klemm-Straße 10, D-48149 Münster, Germany, E-mail: julia_roszjar@yahoo.de, [2]Planetary and Space Sciences Research Institute, The Open University, Milton Keynes, MK7 6AA, UK.

Introduction: We present the first mineralogical and oxygen isotope data for the new eucrite Northwest Africa (NWA) 5073 that has some unique features. This meteorite is a desert find with a total mass of 185 g and represents a non-brecciated unequilibrated eucrite with the coarsest texture ever found among samples of the HED suite.

Results: NWA 5073 has a basaltic texture, mainly composed of zoned pyroxene and plagioclase laths ($An_{76-92}Ab_{8-22}Or_{0-3}$) up to 1.2 cm and 0.2 cm in length, respectively, with minor amounts of mesostasis. The latter consists of ilmenite, Fe-metal, chromite, phosphate (apatite), silica, and anorthite (~An_{95}). Euhedral to anhedral silica grains with sizes up to 0.8 mm were invariably found in the mesostasis, which probably represents the residual melt. Zr-bearing phases (zircon, baddeleyite, and zirconolite) were found in the mesostasis with diameters ranging from 1 to 25 µm [1]. Pyroxenes are unequilibrated with cores of about $En_{60}Fs_{34}Wo_6$ and rims of about $En_{39}Fs_{51}Wo_{10}$. Large pyroxene grains are crossed by veins of Fa-rich olivine (Fa_{67-68}), which are clearly restricted to large pyroxene crystals and always end abruptly at their boundaries, while adjacent minerals are free of them. Similar Fa-rich olivine veins were found in NWA 1000 [2]. NWA 5073 is weakly shocked (S2) [3,4]. Terrestrial weathering (W2-3; [5]) is indicated by the breakdown of about half of the metals and by the occurrence of calcite and Ba- and Sr-bearing sulfates. Based on oxygen isotope data ($\delta^{17}O$ = 1.88 ‰; $\delta^{18}O$ = 4.05 ‰; $\Delta^{17}O$ (linearized [6]) = -0.239 ‰) NWA 5073 is a normal member of the HED suite. The $\Delta^{17}O$ value for the sample is identical to the average HED value obtained by [7], whereas the $\delta^{18}O$ is slightly higher compared to other eucrites analyzed by [7], but within the data range of [8].

Conclusions: This meteorite cooled rapidly as indicated by the presence of skeletal plagioclase, the unequilibrated nature of its pyroxenes and the occurrence of only thin (<1µm) exsolution lamellae in some pyroxenes. Based on grain sizes NWA 1000 resembles NWA 5073 [2]. However, NWA 1000 is severely shocked (S4), as documented by the transformation of half of the plagioclase into maskelynite [2]. Both samples are certainly not fall-paired, but may be launch-paired from the parent body. The occurrence of Fa-rich olivine veins in pyroxenes remains to be explained, since the scenario presented by [2], late-stage material was (shock) mobilized and injected into pyroxene is not satisfying in our view, because it cannot explain why large plagioclases, which obviously crystallized earlier than the late-stage (mesostasis) material, are not involved in the vein forming process.

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