HIGH-K GLASSES AND "KREEPY" CLASTS IN HOWARDITES: EVIDENCE FOR K-RICH TERRANE(S) ON 4-VESTA. J. A. Barrat[1,2], A. Yamaguchi[3], R. C. Greenwood[4], C. Bollinger[1,2], M. Bohn[1,2], A. Jambon[5], O. Boudouma[5], and I.A. Franchi[4]. [1]Université Européenne de Bretagne. [2]UBO-IUEM, CNRS UMR 6538, place Nicolas Copernic, 29280 Plouzané Cedex, France. E-mail: barrat@univ-brest.fr.[3]NIPR, Tachikawa, Tokyo 190-8518. [4]PSSRI, The Open University, Milton Keynes MK7 6AA. [5]UPMC, 4 pl. Jussieu, 75252 Paris Cedex

A few howardites and eucritic breccias contain high-K glass debris and spherules [e.g, 1-3]. Here, we report mainly on the trace element abundances of high-K impact spherules found in two of them, Northwest Africa (NWA) 1664 and 1769, and on a few unusual "KREEPy" clasts found in NWA 1664.

High-K glasses- The high-K impact spherules found in the howardites NWA 1664 and NWA 1769 display remarkable trace element patterns. Compared to eucrites or howardites, they all show prominent enrichments in Cs, Rb, K, Li and Ba, strong depletion in Na, while the REE and other refractory elements are unfractionated. These features could not have been generated during impact melting of their host howardites, nor other normal HED target materials. The involvement of Na-poor rocks, and possibly high-K granites, appears likely.

"KREEPy" clasts- These small fine-grained clasts found in NWA 1664, are Mg-poor and made of a pyroxenoid breakdown product (fayalitic ol, hedenbergitic px, and silica), high-Ca pyroxene with exsolution lamellas, plagioclase, silica, hyalophane (K-Ba feldspar, with sometimes up to 10 wt% BaO), ilmenite, merrillite, apatite, zircon, baddeleyite, and troilite. Although our data are still preliminary, trace element analyses of various phases indicate that these debris are unlike the eucritic mesostases (e.g., [4-5]). They could be possible Vestan counterpart of lunar KREEP rocks. Similar clasts in NWA 1664 were previously described by [6].

We suggest that the high-K spherules formed on Vesta from unusual targets and were ballistically transported into their host breccias. The "KREEPy" clasts could derived from the same targets and are one more evidence for the occurrence of K-rich evolved rocks on Vesta, as first pointed out by [7]. The exact composition of the targets is a matter of debate and cannot be fully constrained with the available data. The remote sensing of Vesta that will be performed from 2011 with the Dawn spacecraft, should allow the identification of chemically different areas on Vesta, and may help pinpoint the source regions of the K-rich lithologies described here.

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