

PLAGIOCLASE COMPOSITION AND THE MARE BASALT COMPONENT IN APOLLO 16 CORE 64001/2; Abhijit Basu, Department of Geology, Indiana University, Bloomington, IN 47405, and David S. McKay, NASA-JSC, Code SN4, Houston, TX 77058.

Korotev et al. [1] have discovered at least three horizons in the Apollo 16 core 64001/2 where a chemical mare basalt component indicates significant (5%, 7%, 12%) mixing of mare basalts into otherwise typical highland material. Petrographic studies of 12 samples from the core, including the level at which the highest concentration of mare basalt chemical component has been seen, does not however reveal any proportionate increase in the population of mare basalt or "pink pyroxene" [2,3].

Steele et al. [4] have shown that the Fe content for given An percent of lunar plagioclases tend to separate mare basalt plagioclases from those found in highland rocks. We have, therefore, performed 6 element (Na, Al, Si, Ca, K, Fe) microprobe analysis of approximately 50 random monomineralic plagioclase grains in the 90-150 μm fraction of each of the 12 samples of 64001/2, and also of those in surface samples 67941 and 64501 for comparison. Plots of FeO vs. An mole percent for each of these plagioclase populations is given in the figures on the next page. Plagioclase grains which may be of mare basalt derivation are circled.

Notice that less than one percent of the total population of some 750 grains may have been derived from mare basalts. If the plagioclase population of Station 13 soil 67941 is considered to be 100% highland in origin, then the proportion of mare basalt plagioclase in the core is almost negligible, because some of the "suspect" grains are compositionally similar to those in 67941. This shows that the physical carrier of the mare basalt component could not have been actual basaltic particles which might have released monomineralic plagioclase in the 90-150 μm size fraction. In view of our previous work [2,3] and current results we totally discount the possibility of finding actual mare basalt fragments which could account for the excess Fe, Sc, and Cr.

It is likely that some unusual clasts in some of the regolith breccias in samples with excess Fe, Sc, and Cr, carry some very fine grained material rich in Fe, Sc, and Cr. We are undertaking a survey of all the regolith breccias in these soils with an analytical SEM with backscatter imaging to find if such is the case. There is also a second remote and perhaps unlikely possibility that an yet unrecognized highland rock type is actually rich in Fe, Sc, and Cr and is providing an anomalous chemical signature. Lastly, it is also possible that some Fe, Sc, Cr-rich glassy objects have been crushed to extremely fine size (< 10 μm) and somehow is mixed in these soils.

REFERENCES: [1] Korotev, R. et al., 1984, JGR, 89, C143-C160; [2] Houck, K.J., 1982, JBR, 87, A197-A209; [3] Basu, A. and McKay, D.S., 1984, JGR, 89, C133-C142; [4] Steele, I. et al., 1977, PLSC 8, 1925-1941.

FEO IN PLAGIOCLASE

