NEW ANALYSES OF MARE BASALTS. J.M. Rhodes[1] and D.P. Blanchard[2]. [1]University of Massachusetts, Amherst, Mass., 01003; [2]NASA-Johnson Space Center, Houston, TX., 77058.

This study provides whole-rock compositional data for a number of mare basalts from several landing sites which to date lack chemical analyses or comprehensive compositional characterization. Procedures used for previous comprehensive mare basalt studies have been followed (1,2,3,4). Major element and several trace element abundances (Rb,Sr,Y,Ga,Nb,Zr,Zn,Ni,Cr,V) have been determined by X-ray fluorescence analysis. Instrumental neutron activation analyses for the rare-earths and other trace elements (Ta,Th,Hf,Sc,Cr,Co) are currently in progress.

APOLLO 12 BASALTS (12019, 12046, 12062, 12072). Sample 12019 has been described as a porphyritic basalt containing phenocrysts of pyroxene and minor olivine in a fine-grained variolitic groundmass, and classified on textural and mineralogical criteria as a member of the pigeonite basalt suite (5,6). The chemical data confirm this assignment, and show that it is almost isochemical with 12011, the least evolved and most rapidly cooled of this particular basalt type (3,6). Samples 12046 and 12002 were described petrographically by James and Wright (5) as olivine-poor, sub-ophitic ilmenite basalts. They are very similar in bulk composition, and, at an MgO content of about 10 percent, have the low SiO_2 and high TiO_2 and magmaphile element abundances that characterize the Apollo 12 ilmenite basalts. Like samples 12047 and 12054, both have low Mg-values (0.37) and high magmaphile element abundances, and are evolved, relative to other basalts in the group (3). Sample 12072, although classified by Baldridge et al., (7) as an olivine basalt on textural and mineralogical grounds, was later assigned by these workers to the rather enigmatic feldspathic basalt group, on the basis of a bulk composition estimated from modal and mineralogical analyses (8). Our analysis differs significantly from this estimate. Both major and trace element abundances clearly indicate that 12072 belongs to the olivine basalt group, in agreement with the mineralogical data. It has an Mg-value of 0.53, which is too high for the forsterite content (Fo_{76}) of the olivine phenocrysts (8), perhaps implying a small amount of olivine accumulation.

APOLLO 15 BASALTS (15085,15529,15536,15596,15598). Samples 15529,15536 and 15598 are all very similar in composition. They have the high FeO and TiO_2, and low SiO_2 and magmaphile element contents characteristic of the olivine basalt group (1), and compare closely with average compositions for this group (1,9). On the other hand, samples 15085 and 15596 have the compositional characteristics of the quartz-normative pigeonite basalts (1,9). Both are similar in composition and also compare closely with average compositions for this basalt group. 15085 is one of the coarse-grained gabbros from Elbow Crater. Previous analyses of this sample show significant deviations from the rest of the pigeonite basalt group (10,11,1) The present analysis, based on a 2g chip, removes this discrepancy.

APOLLO 17 BASALTS (70315, 78585) Both of these samples have been described recently by Warner et al. (12). Our data confirm the assignment of 78585 to the type-B basalts (2). However, we cannot clarify the relationships of sample 70315. This course-grained basalt (Type-U) has some affinities with the rare type-C basalts, but our Sc,Cr and Co data are needed to evaluate this possibility.

Rhodes, J.M., and Blanchard, D.P.

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