

79515**High-Ti Mare Basalt****33.00 g, 4 x 3.5 x 3 cm****INTRODUCTION**

79515 was described as a tan-colored, rounded, intergranular basalt, with no fractures (Apollo 17 Lunar Sample Information Catalog, 1973). It has an inequigranular fabric and the surface is covered with 15-20% cavities (Fig. 1). These contain projecting crystals and possibly some cristobalite. Zap pits are present on T, but none on B.

PETROGRAPHY AND MINERAL CHEMISTRY

Warner et al. (1979) studied 79515, but only generally

described the petrography and mineral chemistry within their whole-rock classification (A, B, C, etc.). During the preparation of this catalog, we examined thin section 79515,4. It is a medium-grained, subophitic to variolitic basalt. Pyroxene and ilmenite (with "sawtooth" margins) reach up to 0.5 mm. Plagioclase forms laths (also up to 0.5 mm) and appears to be interstitial to pyroxene and ilmenite. There are coarser areas of pyroxene, plagioclase, and ilmenite around areas of variolitic texture. Olivine is present, but only as ~0.1 mm (or less) cores to larger pyroxenes. Silica is a late stage interstitial

phase (up to 0.3 mm), as are FeNi metal and troilite (< 0.1 mm).

WHOLE-ROCK CHEMISTRY

The same analysis of 79515 was reported by Ma et al. (1979) and Warner et al. (1979) (Table 1). This basalt has a MG# of 46.2 and TiO₂ contents of 10.2 wt%. Warner et al. (1979) classified this sample as a "Type U" Apollo 17 high-Ti basalt (after Rhodes et al., 1976) because of its coarse grain size. This is surprising, because in the thin section we studied, this basalt is not coarse-grained! The REE profile is

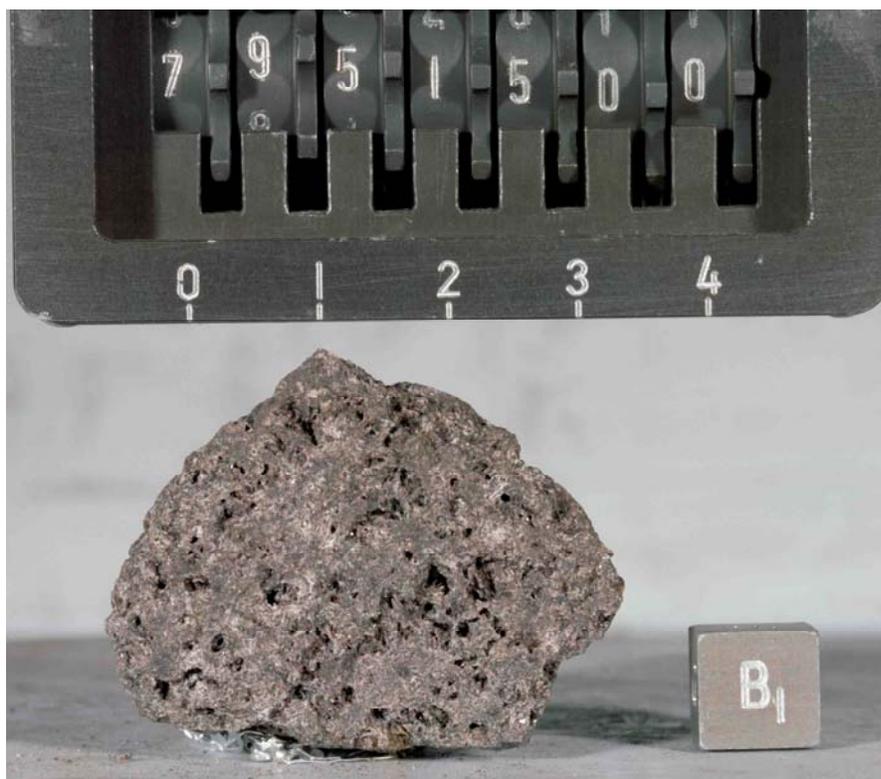


Figure 1: Hand specimen photograph of 79515,0.

LREE-depleted, with a smooth increase (relative to chondrites) from La to Sm (Fig. 2). The profile has a maximum at Sm. The profile from Tb to Lu is flat at approximately 30 x chondrites. A negative Eu anomaly is present $[(Eu/Eu^*)_N = 0.54]$.

PROCESSING

Of the original 33g of 7951,15,0, 31.78 remains. Sub-sample ,1 was irradiated for INAA acid ,4 is the thin section number.

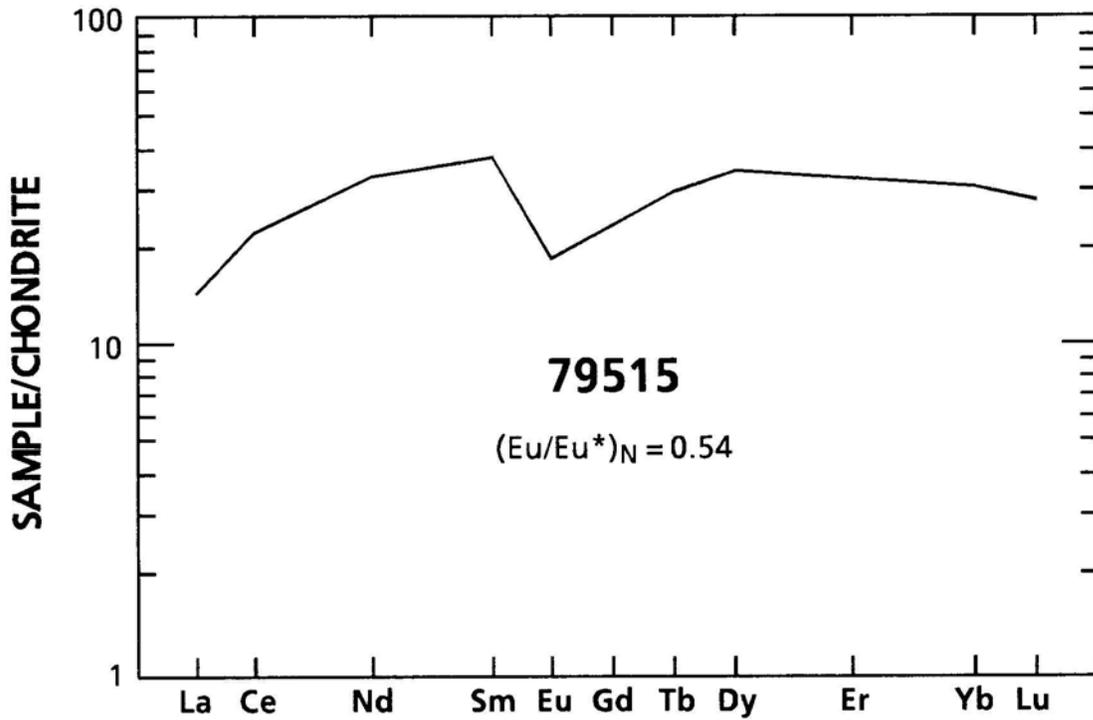


Figure 2: Chondrite -normalized rare earth element profiles of 79515, taken from Ma et al. (1979) and Warner et al. (1979).

Table 1: Whole-rock chemistry of 79515.
 Data from Ma et al. (1979) and Warner et al. (1979) (same analysis)

Sample 79515,1 Method N		Sample 79515,1 Method N	
SiO ₂		V	120
TiO ₂	10.2	Sc	82
Al ₂ O ₃	9.1	Cr	
Cr ₂ O ₃	0.439	La	5.3
FeO	18.7	Ce	20
MnO	0.275	Nd	21
MgO	9	Sm	7.7
CaO	11.0	Eu	1.42
Na ₂ O	0.385	Gd	
K ₂ O	0.048	Tb	1.7
P ₂ O ₅		Dy	12
S		Er	
Nb (ppm)		Yb	6.7
Zr		Lu	0.96
Hf	6.2	Ga	
Ta	1.4	F	
U		Cl	
Th		C	
W		N	
Y		H	
Sr		He	
Rb		Ge (ppb)	
Li		Te	
Ba		Ag	
Cs		Sb	
Be		Ir	
Zn		As	
Pb		Au	
Cu		Ru	
Ni		Os	
Co	23		

Analysis by: N = INAA.