

71035**High-Ti Mare Basalt**
144.8 g, 8 x 5 x 2.5 cm**INTRODUCTION**

71035 was described as a medium gray, intergranular, medium-grained porphyritic basalt, containing up to 40% subrounded to irregular vugs (Fig. 1) ranging from 0.2-1cm diameter (Apollo 17 Lunar Sample Information Catalog, 1973). The predominant mineral in these vugs is ilmenite. The fabric is mediumgrained, porphyritic. Band S are fresh, T, N, E, and W are rounded and dusty. Zap pits are sparse and only found on T, N, E,

and W. This basalt was collected from Station 1A.

PETROGRAPHY AND MINERAL CHEMISTRY

Brown et al. (1975ab) described 71035 as a Type IB in their classification of Apollo 17 high-Ti mare basalts. They reported modes of this sample as: 1.4% olivine; 23.6% opaque minerals; 23.7% plagioclase; 47.5% clinopyroxene; and 3.8% silica. These authors described the texture and mineral chemistry

of 71035 within the general confines of their textural groups, not specifically mentioning this sample. However, during the preparation of this catalog, we examined thin sections 71035,26 and ,28, finding it to be a medium-to coarse-grained plagioclase poikilitic basalt. Pyroxenes reach 1mm and plagioclase 1.5-2mm. Occasional olivine cores (< 0.1 mm) are present in pyroxene. Rare armalcolite inclusions (~ 0.1mm) are seen in the pyroxene. Ilmenite (up to 0.5mm) is interstitial and



Figure 1: Hand specimen photograph of 71035,0.

blocky. Silica (up to 0.3mm), native Fe, and troilite form interstitial phases.

Brown et al. (1975a,b) have only reported pyroxene compositions for 71035. These range from titan-augite to pyroxferroite. No pigeonite is present.

WHOLE-ROCK CHEMISTRY

The whole-rock chemistry of 71035 was reported by Rhodes et al. (1976) (Table 1). These authors noted that 71035 contained 13.1 wt% TiO₂ with a MG# of 41.9 and described it as a Type B Apollo 17 high-Ti basalt. 71035 can be further classified as a Type B2 basalt

using the criteria of Neal et al. (1990). The REE profile (Fig. 2) is LREE-depleted, but the HREE are depleted relative to the MREE, giving the profile a convex-upward aspect. A negative Eu anomaly is present ($[Eu/Eu^*]_N = 0.49$). Gibson et al. (1976ab) reported sulfur abundances in 71035 as 1660 µgS/g with an equivalent wt% of Fe⁰ of 0.132%. Hughes and Schmitt (1985) reported Zr (29.9 ppm) and Hf (6.5 ppm) abundances in 71035.

ISOTOPES

Nyquist et al. (1976) reported the whole-rock Sr isotopic composition of 71035 (Table 2).

No Sm-Nd or Pb or stable isotope work has been undertaken on this sample. Other reported isotopic abundances are concerned with cosmic-ray induced radionuclides (LSPET, 1973; Rancitelli et al., 1974; Yokoyama et al., 1974).

PROCESSING

Little work has been undertaken on this basalt. Of the original 144.88, only 3 g has been used having 141.8g of 71035,0. Three thin sections have been made - 71035,28-30.

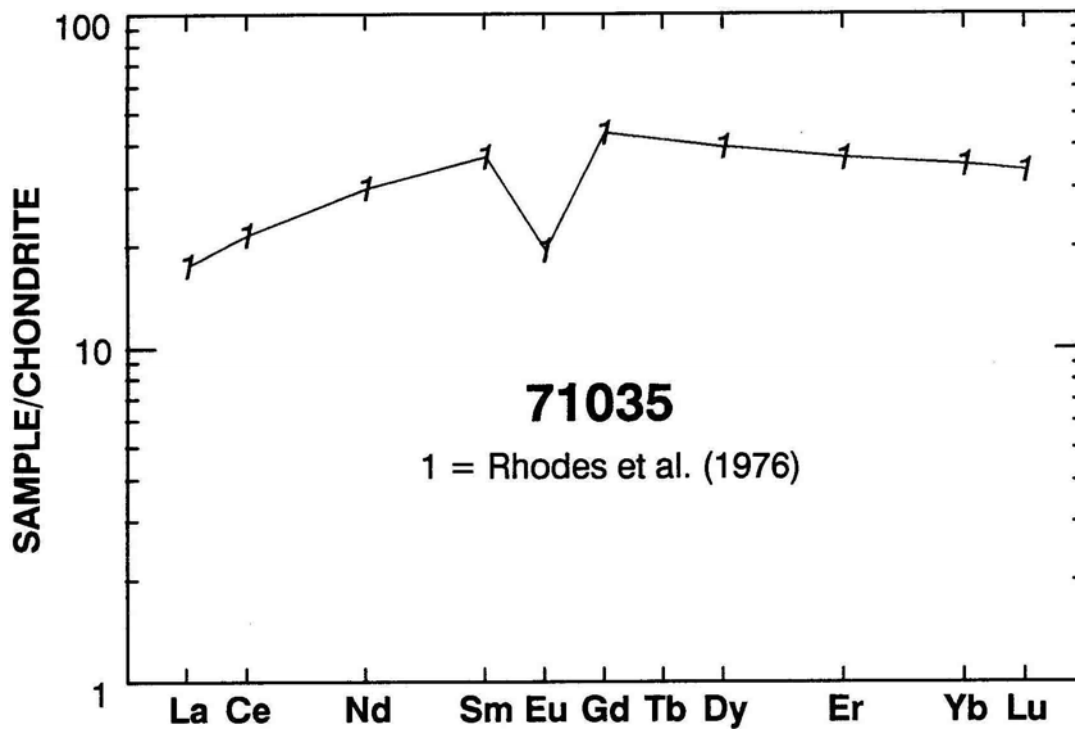


Figure 2: Chondrite-normalized rare-earth element profile of 71035.

Table 1: Whole-rock chemistry of 71035.
Data from Rhodes et al. (1976).

	71035,4 X,I		71035,4 X,I
SiO ₂ (wt %)	38.25	Cu	
TiO ₂	13.06	Ni	
Al ₂ O ₃	8.77	Co	19.0
Cr ₂ O ₃	0.39	V	
FeO	19.74	Sc	87
MnO	0.29	La	5.77
MgO	7.98	Ce	18.7
CaO	10.87	Nd	18.8
Na ₂ O	0.38	Sm	7.50
K ₂ O	0.03	Eu	1.50
P ₂ O ₅	0.10	Gd	12.1
S	0.39	Tb	
Nb (ppm)		Dy	13.6
Zr		Er	8.27
Hf	7.0	Yb	7.71
Ta		Lu	1.14
U		Ga	
Th		F	
W		Cl	
Y		C	
Sr	130	N	
Rb	0.41	H	
Li	7.6	He	
Ba	66.3	Ge (ppb)	
Cs		Ir	
Be		Au	
Zn		Ru	
Pb		Os	

Table 2: Sr isotope composition of 71035.
Data from Nyquist et al. (1976).

	71035,4
wt. (mg)	50
Rb (ppm)	0.406
Sr (ppm)	130
$^{87}\text{Rb}/^{86}\text{Sr}$	0.0090 ± 4
$^{87}\text{Sr}/^{86}\text{Sr}$	0.69967 ± 5
T_B	4.42 ± 0.59
T_L	4.99 ± 0.59

B = Model age relative to BABI
L = Model age relative to LUNI

Table 3: Cosmogenic radionuclide and radioelement abundances of 71035,0. 1

	1	2
Th (ppm)	0.32 ± 0.06	0.36 ± 0.03
U (ppm)	0.11 ± 0.02	0.096 ± 0.011
K (ppm)	460 ± 100	200 ± 20
^{26}Al (dpm/kg)	37 ± 8	79 ± 3
^{22}Na (dpm/kg)	45 ± 9	92 ± 4
^{54}Mn (dpm/kg)	42 ± 10	164 ± 15
^{56}Co (dpm/kg)	59 ± 20	279 ± 14
^{46}Sc (dpm/kg)	30 ± 10	87 ± 5
^{60}Co (dpm/kg)		< 4.6
Th/U	2.9 ± 0.8	4.00
K/U	4200 ± 1200	2450

1 = LSPET (1973); 2 = Rancitelli et al. (1974).