

70185**High-Ti Mare Basalt****466.6 g. 9 x 7.5 x 5.5 cm and 3.2 x 2.3 x 1.5 cm****INTRODUCTION**

70185 was described as a medium gray, irregular, but intergranular mare basalt (Fig. 1), containing many zap pits (Apollo 17 Lunar Sample Information Catalog, 1973). The grain size and number of cavities varies over the sample. During return, this sample split into two pieces forming 70185, 0 and ,1 (Fig. 2). On 70185,1, the grain size is coarser than on ,0, with plagioclase laths reaching up to 2.5 mm. 70185 was collected approximately 40 m

north of the ALSEP central station.

PETROGRAPHY AND MINERAL CHEMISTRY

70185,29 was studied by Brown et al. (1975a,b), who described this basalt as a Type IB, or plagioclase poikilitic. This basalt is composed of: 47.6% pyroxene; 24% plagioclase; 23.9% opaque minerals; 4.1% silica; 0.4% olivine. The specific petrography and mineral chemistry of 70185 is not mentioned

by Brown et al. (1975a,b), rather they are described within the general context of Type IB basalts. In the compilation of this catalog, we studied thin sections 70185,30 and ,31. These exhibited essentially the same petrographic relations. Large (up to 1 mm) ilmenite laths overlay pyroxene (up to 1.2 mm) and plagioclase (up to 1.5 mm). Rare armalcolite inclusions occur in pyroxene, and ilmenite possesses both chromite and rutile exsolution lamellae (< 0.005 mm wide). Olivine usually forms the cores



Figure 1: Hand specimen photograph of 70185,0.



Figure 2: Subdivision of 70185,0.

of the large pyroxenes. Silica, native Fe, and troilite form interstitial phases.

WHOLE-ROCK CHEMISTRY

The whole-rock chemistry for 70185 has been determined by Warner et al. (1975) and Rhodes et al. (1976) from sub-samples 70185,5 and 70185,32, respectively (Table 1). Both Warner et al. (1975) and Rhodes et al. (1976) class this basalt as a Type U (Unclassifiable), suggesting the coarse-grained nature of this sample precludes obtaining a representative analysis. This is witnessed in Figure 3, where the REE contents of 70185 reported by Warner et al. (1975) are elevated

relative to those reported by Rhodes et al. (1976). However, both are LREE-depleted with a convex-upward profile. Furthermore, the magnitudes of

the negative Eu anomaly are similar ($[Eu/Eu^*]_N = 0.54$ and 0.51 , resp.). Whole-rock analyses for specific elements have also been reported. Gibson et al.

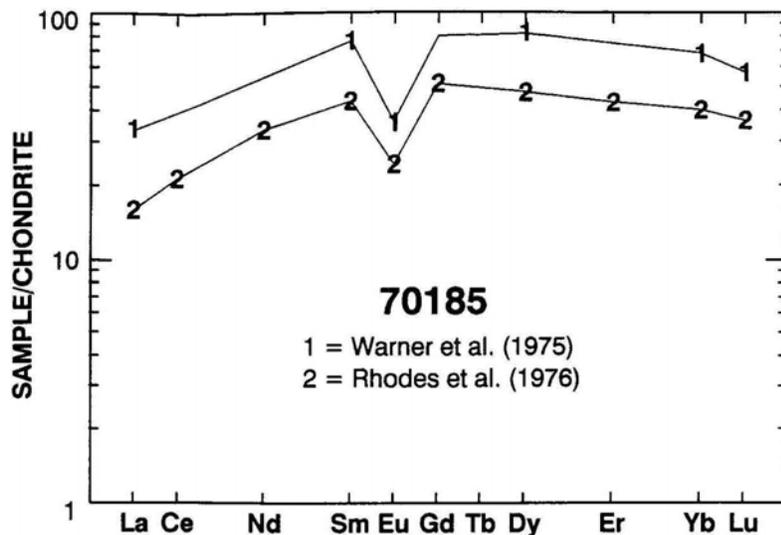


Figure 3: Chondrite-normalized rare-earth element profile of 70185

Table 1: Whole-rock compositions of 70185.

	70185	
	1	2
SiO ₂ (wt %)		40.18
TiO ₂	9.6	11.52
Al ₂ O ₃	10.2	9.04
Cr ₂ O ₃	0.353	0.40
FeO	18.9	17.64
MnO	0.237	0.26
MgO	8.1	8.11
CaO	11.1	11.95
Na ₂ O	0.433	0.39
K ₂ O	0.093	0.04
P ₂ O ₅		0.02
S		0.17
Nb (ppm)		
Zr		
Hf		8.2
Ta		
U		
Th		
W		
Y		
Sr		173
Rb		0.49
Li		9.6
Ba		66.3
Cs		
Be		
Zn		
Pb		
Cu		
Ni		
Co	15.9	19.7
V	72	---
Sc	84	84
La	11.1	5.24
Ce		18.5
Nd		21.1
Sm	15.4	8.83
Eu	2.74	1.87

Table 1: (Concluded).

	1	70185	2
Gd			14.0
Tb			
Dy	28		16.0
Er			9.52
Yb	14.7		8.67
Lu	1.9		1.21
Ga			
F			
Cl			
C			
N			
H			
He			
Ge (ppb)			
Ir			
Au			
Ru			
Os			

1 = Warner et al. (1975); 2 = Rhodes et al. (1976).

(1976a,b) analyzed 70185 for sulfur and noted that this basalt contained 1850 ± 50 pg/g of total sulfur, with an equivalent weight of Fe^o of 0.120%. Eldridge et al. (1974a,b) determined the primordial radio-element concentrations in 70185 by gamma-ray spectrometry. 70185 contains 420 ppm K, 0.3 ppm Th, and 0.1 ppm U.

ISOTOPES

70185 has been analyzed for Sr isotopes by Nyquist et al. (1976).

Only a whole-rock determination was reported and no dating was undertaken. 70185 contains a present day ⁸⁷Sr/⁸⁶Sr ratio of 0.69954 ± 8 . Results of this study are presented in Table 2.

Cosmogenic radio-nuclides were determined by LSPET (1973) with the same analysis also reported by O'Kelley et al. (1974a,b) and are presented in Table 3. Yokoyama et al. (1974) reported that 70185 was saturated with ²⁶Al.

PROCESSING

Approximately 449 g of 70185,0 remains. Most of the splitting has occurred on 70185, 1, of which 9.09 g remains. Four thin sections have been prepared - 70185,9, ,29, ,30, ,31.

Table 2: Isotopic composition of 70185.

Data from Nyquist et al. (1976).

70185 (whole-rock)	
wt. (mg)	51
Rb (ppm)	0.495
Sr	173
⁸⁷ Rb/ ⁸⁶ Sr	$0.0083 + 3$
⁸⁷ Sr/ ⁸⁶ Sr	$0.69954 + 8$
T _B	$3.72 + 0.81$
T _L	$4.29 + 0.81$

T_B = Model age assuming
I = 0.69910 (BABI + JSC bias);
T_L = Model age assuming
I = 0.69903 (Apollo 16 anorthosites for T = 4.6 Ga).

Table 3: Cosmogenic radionuclide abundances for 70185.

Data from the Apollo 17 Preliminary Science Report (1973)

70185	
Th (ppm)	$0.30 + 0.03$
U (ppm)	$0.10 + 0.02$
K (%)	$0.042 + 0.004$
²⁶ Al (dpm/kg)	$70 + 4$
²² Na (dpm/kg)	$50 + 4$
⁵⁴ Mn (dpm/kg)	$95 + 10$
⁵⁶ Co (dpm/kg)	$105 + 10$
⁴⁴ Sc (dpm/kg)	$47 + 5$
Th/U	$3.0 + 0.7$
K/U	$4200 + 900$