71559

High-Ti Mare Basalt
82.16 g

INTRODUCTION

See "Rake Sample Descriptions" and "Table of Rake Samples", as well as Fig. 1.

PETROGRAPHY AND MINERAL CHEMISTRY

Warner et al. (1975b,c, 1976a,b, 1978) reported the petrography and mineral chemistry of 71559. Warner et al. (1975c) described 71559 as a medium grained, sub-ophitic basalt similar to the Apollo 11 ophitic basalts. Pyroxenes zone from titanaugite (~$En_{44}W0_{40}Fs_{16}$; ~3.5 wt% $A_{12}O_3$; ~5 wt% TiO_2) to pyroxferroite, but not toward pigeonite, which is absent (Fig. 2). Ilmenite is much less modally abundant (as seen from Fig. 3), and there is no olivine or Cr-ulvospinel.

During the preparation of this catalog, we examined thin section 71559,7 and found it to be a medium-grained, subophitic basalt (Fig. 3). It is dominated by pink pyroxene and plagioclase, with occasional ilmenite phenocrysts reaching up to 1.5mm (Fig. 3). Rutile and chromite exsolution lamellae were observed in the ilmenite. Native Fe and troilite (up to 0.2mm) may or may not be associated with ilmenite. Interstitial SiO_2 (up to 0.4mm) is conspicuous, forming "crinkled" patches as seen in Fig. 3. No armalcolite, olivine, or Cr-ulvospinel was observed.

WHOLE-ROCK CHEMISTRY

Laul et al. (1975) and Warner et al. (1975) reported the same whole-rock analysis of 71559,1 in a study of Apollo 17 rake samples (Table 1). Based on the whole-rock classification of Rhodes et al. (1976) and Warner et al. (1979), 71559 is classified as a Type A Apollo 17 high-Ti basalt. This sample contains

Figure 1: Hand specimen photograph of 71559,0. Cubic scale = 1 cm^3.

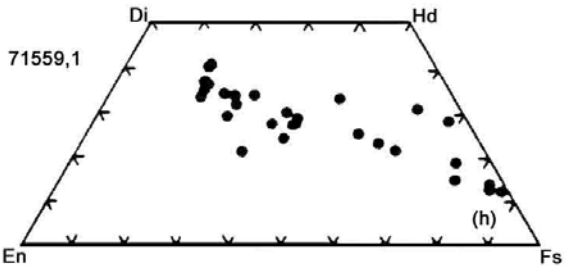

Figure 2: Quadrilateral of pyroxene compositions from 71559,1.

8.3 wt% TiO_2, with a MG# of 38.7. The REE profile (Fig. 4) is LREE-depleted with a maximum at Sm. The HREE exhibit a slight depletion compared to the NVIREE, but are still enriched (relative to chondrites) over the LREE. A negative Eu anomaly is present [(Eu/Eu*)N = 0.60].

PROCESSING

Of the original 82.168 of 71559,0, a total of 71.1g remains. 71559,1 was also assigned the number,9001 and was used for INAA. Thin section ,7 was taken from this irradiated sample.

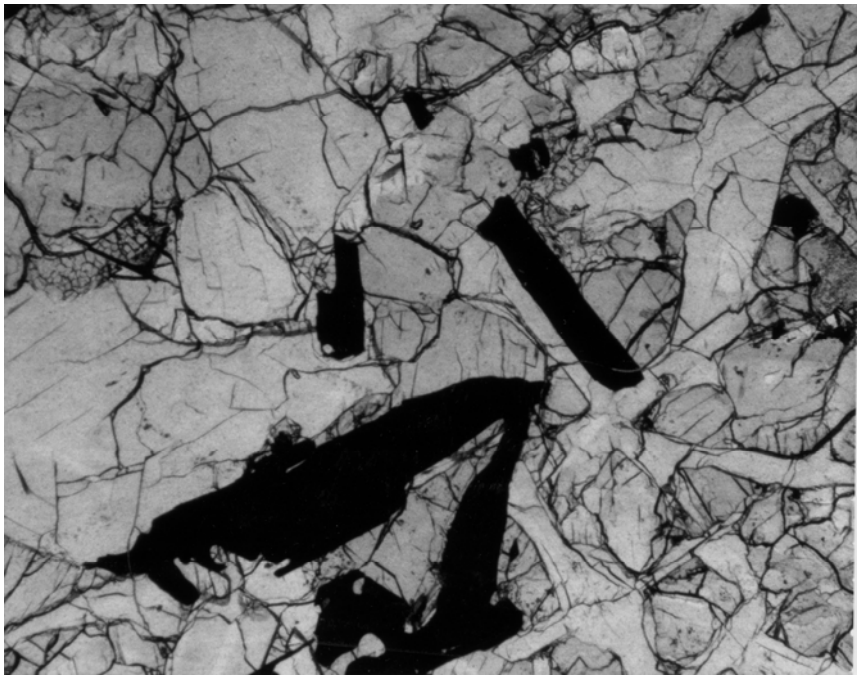

Figure 3: Photomicrograph of 71559,7. A sub-ophitic texture predominates, Field of view = 2.5 mm.

Table 1: Whole-rock chemistry of 71559.
Data from Laul et al. (1975) and Warner et al. (1975) (same analysis).

	Sample 71559,1 Method N		Sample 71559,1 Method N
SiO_2 (wt %)		Cu	
TiO_2	8.3	Ni	
Al_2O_3	10.3	Co	14.4
Cr_2O_3	0.228	V	30
FeO	17.8	Sc	72
MnO	0.226	La	6.6
MgO	6.3	Ce	26
CaO	12.2	Nd	24
Na_2O	0.48	Sm	10.4
K_2O	0.068	Eu	2.20
P_2O_5		Gd	
S		Tb	2.6
Nb (ppm)		Dy	17
Zr		Er	
Hf	8.8	Yb	9.2
Ta	1.5	Lu	1.4
U		Ga	
Th		F	
W		Cl	
Y		C	
Sr		N	
Rb		H	
Li		He	
Ba		Ge (ppb)	
Cs		Ir	
Be		Au	
Zn		Ru	
Pb		Os	

Analysis by: N = INAA.

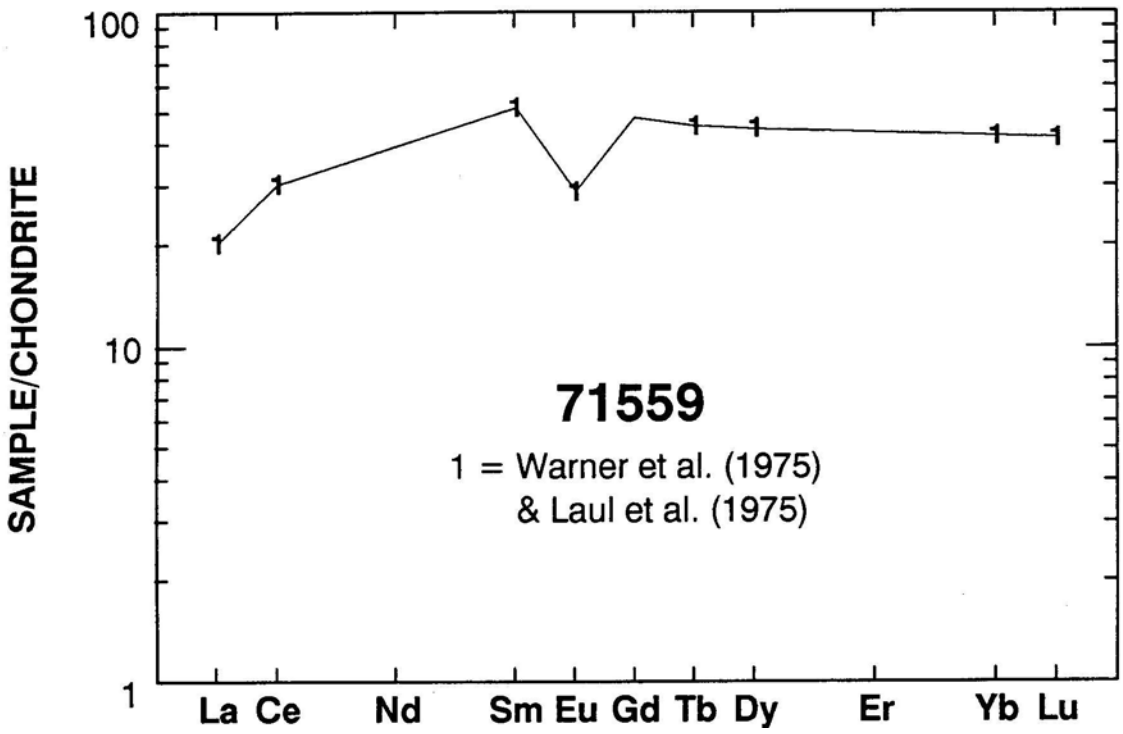

Figure 4: Chondrite -normalized rare-earth element plot of 71559. The same analysis was reported by Warner et al. (1975) and Laul et al. (1975).