71538

High-Ti Mare Basalt
8.04 g

INTRODUCTION

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

PETROGRAPHY AND MINERAL CHEMISTRY

Warner et al. (1978) reported the petrography and mineral chemistry of 71538. During the preparation of this catalog, we examined thin section 71538,4 and found it to be a medium-grained basalt (0.2-0.4mm). It is comprised of interlocking "bow-tie" intergrowths of pyroxene and plagioclase (Fig. 2), as well as blocky plagioclase and pyroxene. Opaque interstitial glass is unevenly distributed. Phenocrysts of ilmenite (up to lmm) and corroded olivine (up to 0.5mm) are present (Fig. 2), with euhedral chromite inclusions (~0.005mm) present in the olivines (Fig. 2b). Pink pyroxene usually mantles these oiivines (Fig. 2b). Ilmenites exhibit "sawtooth" margins (Fig. 2a) and contain minor rutile and chromite exsolution features. Native Fe and troilite (< < 0.1 mm) are disseminated throughout. No armalcolite is present.

WHOLE-ROCK CHEMISTRY

Murali et al. (1977) reported the whole-rock composition of 71538,2 in a study of Apollo 17 rake samples (Table 1). Based on the classification of Rhodes et al. (1976) and Warner et al. (1979), 71538 is classified as a Type A Apollo 17 high-Ti basalt. This sample contains 12.8 wt% TiO_2, with a MG# of 43.8. The REE prolile (Fig. 3) is LREE-depleted with a maximum at Sm. The HREE exhibit a decrease from Dy to Lu, but are in approximately the same abundance (relative to chondrites) as the LREE. A negative Eu anomaly is present E(Eu/Eu*)N = 0.54].

PROCESSING

Of the original 8.048 of 71538,0, a total of 6.86g remains. 71538,1 was used for INAA, and thin section 71538,5 was taken from the irradiated sample.

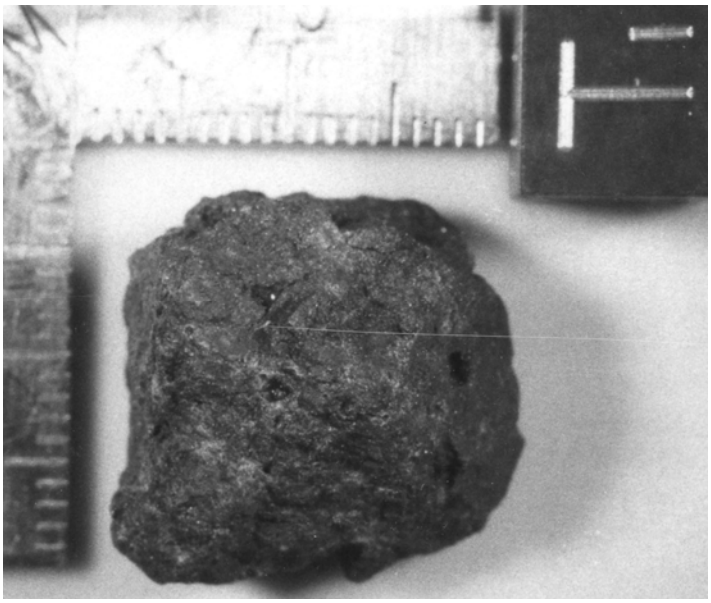
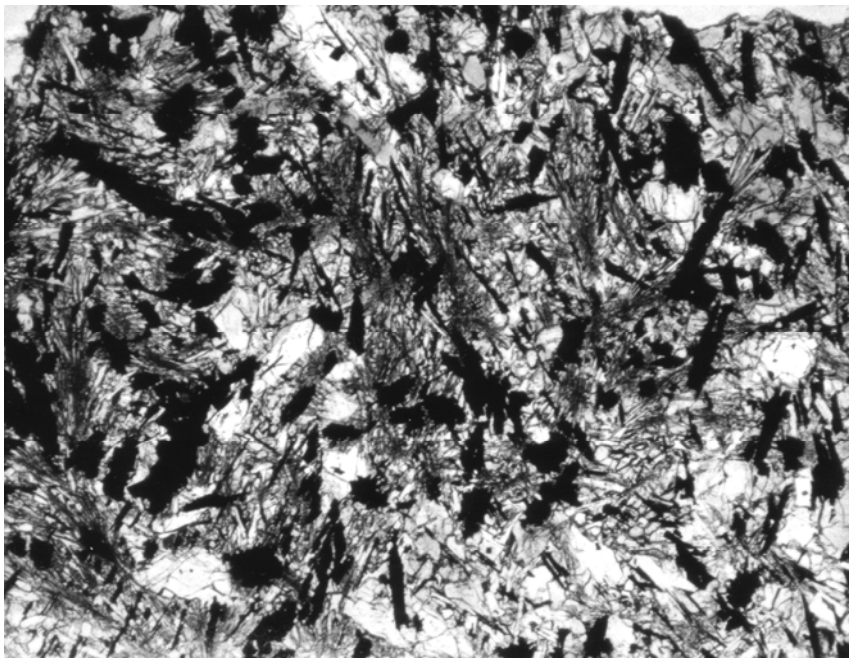
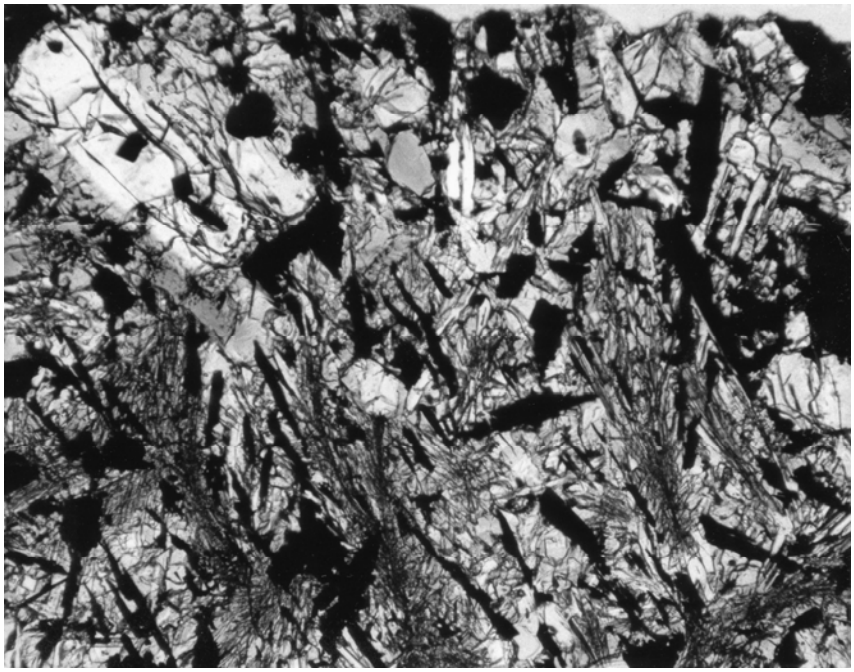


Figure 1: Hand specimen photograph of 71538,0. Small divisions on scale are in millimeters.



2a: Olivine and ilmenite microphenocrysts set in a glassy, variolitic matrix - field of view = 2.5 mm.



2b: Gradation from variolitic to blocky texture - field of view = 1.25 mm.

Figure 2: Photomicrographs of 71538,4.

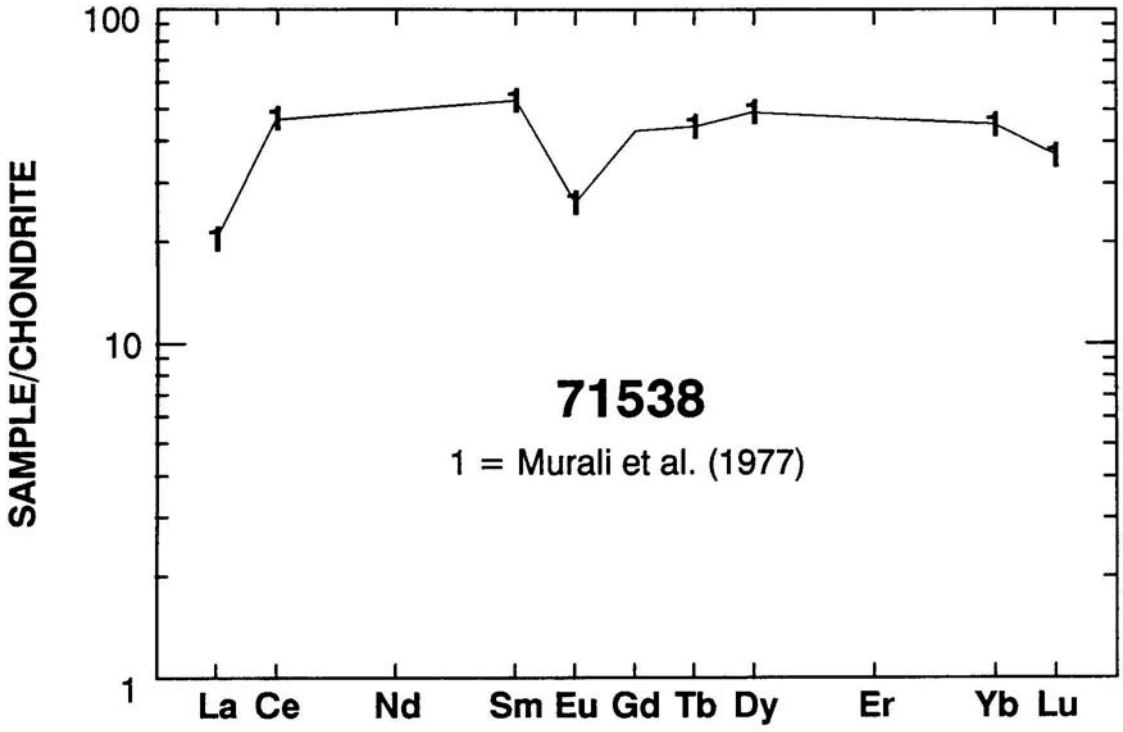


Figure 3: Chondrite -normalized rare-earth element plot of 71538. Data from Murali et al. (1977).

Table 1: Whole-rock chemistry of 71538.
Data from Murali et al. (1977).

	Sample 71538,2 Method N		Sample 71538,2 Method N
SiO_2 (wt %)		Cu	
TiO_2	12.8	Ni	
Al_2O_3	8.4	Co	17.7
Cr_2O_3	0.430	V	109
FeO	19.7	Sc	79
MnO	0.251	La	6.8
MgO	8.6	Ce	41
CaO	10.1	Nd	
Na_2O	0.40	Sm	10.9
K_2O	0.064	Eu	2.03
P_2O_5		Gd	
S		Tb	2.6
Nb (ppm)		Dy	17
Zr		Er	
Hf	9.0	Yb	10.0
Ta	1.7	Lu	1.25
U		Ga	
Th		F	
W		Cl	
Y		C	
Sr		N	
Rb		H	
Li		He	
Ba		Ge (ppb)	
Cs		Ir	
Be		Au	4 ± 1
Zn		Ru	
Pb		Os	

Analysis by: N = INAA.