74245

Aphanitic High-Ti Basalt
63.34 g, 5.5 x 3.5 x 2 cm

INTRODUCTION

74245 has been described as a very fine-grained to aphanitic, dark gray, angular basalt (Fig. 1) with a semi-metallic luster. Both of the broadest surfaces are fresh fractures. The thicker edge of the wedge and the blunt end are remnants of former interior cavity walls. They are angular and somewhat intricately patterned but smoothed over with a black surface layer having a semi-metallic luster and numerous felty ilmenite needles. No zap pits are present, but cavities are found on ~20% of the fractured surfaces. Generally, they are rounded to somewhat irregular and are between 0.3mm to lem. These cavities are lined with felty intergrowths of lustrous ilmenite needles. 74245 is a dense, ilmenite-rich basalt with a grain size of < 0.1mm. The groundmass includes fine needles visible only in reflected light. Yellow olivine grains, averaging 0.7mm are sparsely disseminated throughout the sample. This sample was collected from Station 4.

PETROGRAPHY AND MINERAL CHEMISTRY

Brown et al. (1975) described 74245,26 as a Type lA Apollo 17 high-Ti basalt. These authors reported the following modal composition: 15.6% olivine, 30.6% opaques, 2.0% plagioclase, 31.9% clinopyroxene, and 19.9% mesostasis. The olivines are forsteritic (Fo_{79-76}) and are the only mineral composition reported for 74245 by Brown et al. (1975). No detailed petrographic description of 74245 was reported by these authors. During the preparation of this catalog, we examined thin section 74245,11 and found it to be a fine-grained (up to 0.2mm), interlocking basalt. The groundmass is comprised of plagioclase laths, ilmenite prisms, pink, blocky pyroxene, and opaque glass. A "large", rounded troilite mass (~ 0.1mm) is present. Olivine (up to 1 mm - Fig. 2), ilmenite (~0.7mm), and armalcolite phenocrysts were identified. Armalcolite forms cores to the ilmenite, but also occurs as discrete grains. The olivines contain euhedral chromite inclusions (~0.005mm Fig. 2). Native Fe and troilite (< 0.05mm) are disseminated throughout.

WHOLE-ROCK CHEMISTRY

Detailed whole-rock analyses of 74245 have been conducted by Warner et al. (1975) and Rhodes et al. (1976) (Table 1), who classified 74245 as a Type C

Figure 1: Hand specimen photograph of 74245.

Apollo 17 high-Ti basalt. These authors reported a TiO_2 content of 11.9 and 11.92 wt% (respectively) and MG#'s of 52.0 and 48.8 (respectively). Both Warner et al. (1975) and Rhodes et al. (1976) reported REE abundances (Fig. 3 and Table 1). Both profiles are LREE depleted with a maximum at Sm (Warner et al., 1975) and Dy (Rhodes et al., 1976). Both analyses fail to report the critical elements Gd and Tb for definition of the negative Eu anomaly. However, by extrapolation, values for (Eu/Eu*)N have been determined as 0.51 (Warner et al., 1975) and 0.46 (Rhodes et al., 1976). Both profiles exhibit a depletion of the HREE from Dy (Fig. 3). The analysis of Rhodes et al. (1976) yielded slightly higher REE abundances relative to that of Warner et al. (1975).

PROCESSING

Of the original 64.348 of 74245,0, a total of 30.80g remains. Sub-samples of significant size (i.e., > lg) are 74245,1 (2.O1g) and,31 (26.91g), 74245,5 was used for INAA, and thin section, 11 was taken from this irradiated sub-sample. Three other thin sections have been made -,26,,27, and,28.

EXPERIMENTAL

74245 has been used in one experimental study. Usselman et al. (1975) experimentally determined the cooling rate of 74245 as being 15-25°C/hr.

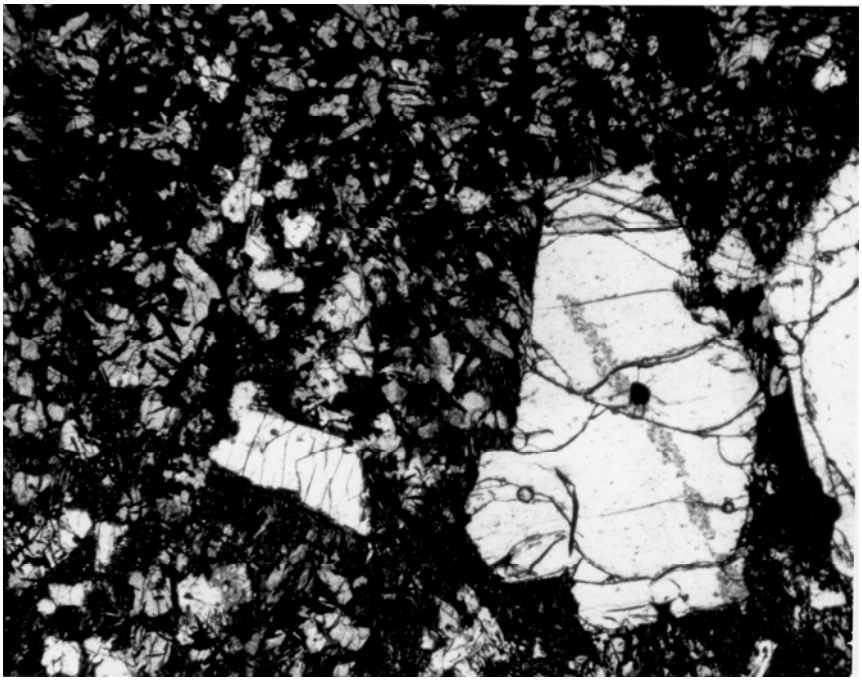

Figure 2: Photomicrograph of 74245. Field of view is 2.5 mm.

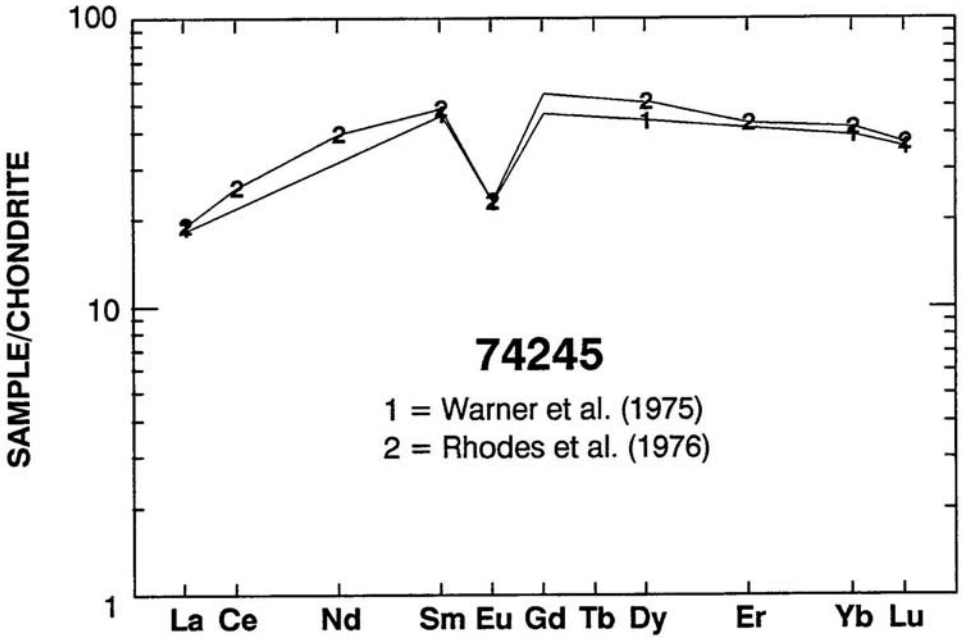

Figure 3: Chondrite-normalized rare-earth-element profiles of 74245.

Table 1: Whole-rock chemistry of 74245.

	Sample ,5 Reference 1 Method N	Sample ,4-7 Reference 2 Method X,N,I		Sample ,5 Reference 1 Method N	Sample ,4-7 Reference 2 Method X,N,I
SiO_2		38.59	Cu		
TiO_2	11.9	11.92	Ni		
Al_2O_3	8.7	8.72	Co	22.7	23.6
Cr_2O_3	0.523	0.54	V	123	
FeO	18.4	18.06	Sc	77	77
MnO	0.227	0.27	La	6.1	6.24
MgO	11.2	9.65	Ce		22.2
CaO	10.2	10.59	Nd		24.9
Na_2O	0.355	0.36	Sm	9.4	9.80
K_2O	0.085	0.06	Eu	1.76	1.77
P_2O_5		0.04	Gd		
S		0.14	Tb		
K (ppm)		655	Dy	15	17.5
Nb			Er		9.68
Zr			Yb	8.6	9.13
Hf		8.7	Lu	1.2	1.25
Ta			Ga		
U			F		
Th			Cl		
W			C		
Y			N		
Sr		159	H		
Rb		1.17	He		
Li		8.5	Ge (ppb)		
Ba		67.4	Ir		
Cs			Au		
Be			Ru		
Zn			Os		
Pb					

Analysis by: N = INAA; X = XRF; I = Isotope dilution.

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

Table 2: Rb-Sr composition of 74245.
Data from Nyquist et al. (1976).

Sample	74245,4-7
wt (mg)	50
Rb (ppm)	1.17
Sr (ppm)	159
$^{87}Rb/^{86}Sr$	0.0213 ± 3
$^{87}Sr/^{86}Sr^{b}$	0.70040 ± 6
T_B	4.26 ± 0.25
T_L	4.49 ± 0.25

b = Uncertainties correspond to last two figures and are 2 sigma - normalized to $^{88}Sr/^{86}Sr = 8.37521$; B = Model age assuming I = 0.69910 (BABI + JSC bias); L = Model age assuming I = 0.69903 (Apollo 16 anorthosites for T = 4.6 Ga).