

71175**High-Ti Mare Basalt****207.8 g, 8 x 5 x 4 cm****INTRODUCTION**

71175 (Fig. 1) was described as a medium gray, subangular, equigranular basalt (Apollo 17 Lunar Sample Information Catalog, 1973). All surfaces are dusty except where fragments have broken off. 71175 contains

only rare zap pits (on T) and 5-10% miarolitic cavities (1-8mm diam) which have irregular distributions and shapes. These cavities rarely contain euhedral minerals. The surface of the cavities is like the surface of the rock. Some cavities are tabular. There is some suggestion of

crystal growth along fractures emanating from pipe-like cavities. Two small fragments can be re-mated to the largest piece and have typical outer and fresh surfaces and mineral percentages. This basalt has a subangular shape with a few non-penetrative and penetrative

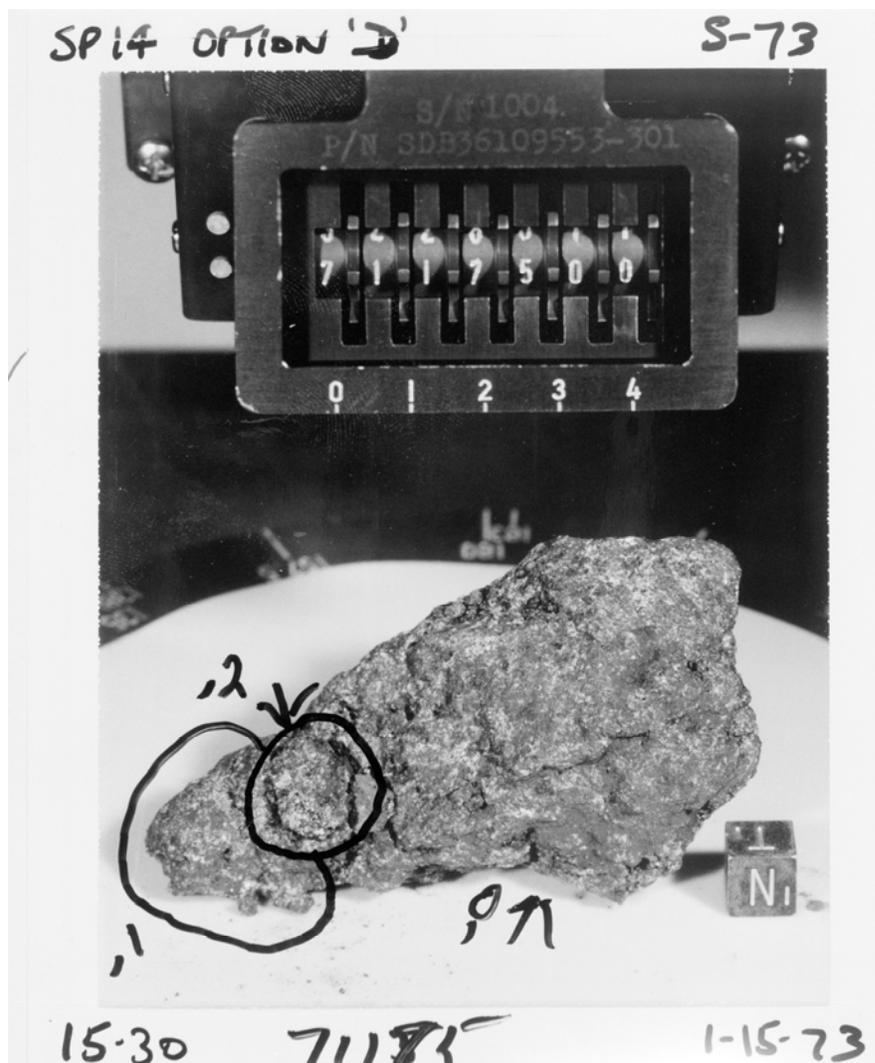


Figure 1: Hand specimen photograph of 71175,0 showing both north and top surfaces. Cubic scale= 1 cm³.

fractures. 71175 was collected from Station 1A.

PETROGRAPHY AND MINERAL CHEMISTRY

Brown et al. (1975) described 71175 as a Type IB Apollo 17 basalt, containing 1.7% olivine, 19.4% opaques, 27.1% plagioclase, 50.2% clinopyroxene, and 1.6% silica. Brown et al. (1975) do not specifically mention either the mineral relations or mineral chemistry of 71175 within their general petrographic descriptions. However, Roedder and Weiblen (1975) reported the compositions of anomalous "low-K" silicate melt inclusions in ilmenite from 71175. During the preparation of this catalog we examined thin

section 71175,39, finding it to be a coarse-grained (0.5-2mm) subophitic to plagioclase-poikilitic basalt (Fig. 2). Olivine is rare, forming the rounded cores of the larger pyroxenes. Interstitial, blocky ilmenite overlays a network of plagioclase and pyroxene (px > plag). Rutile and chromite exsolution is abundant in the ilmenites and Fe-Metal and troilite (up to 0.2mm) is occasionally associated with ilmenite. No armalcolite was found. Interstitial SiO₂ (up to 0.8mm) is conspicuous.

WHOLE-ROCK CHEMISTRY

The whole-rock chemistry of 71175 has been reported by Warner et al. (1975) and Rhodes et al. (1976) (Table 1) These authors quote a TiO₂

content of 12.7 and 13.08 wt%, respectively, with MG#s of 46.8 and 47.0, respectively. The REE profiles are similar in that they are both LREE-depleted with linear HREE abundances (Fig. 3), with the highest normalized REE abundances being in the MREE. The analysis of Rhodes et al. (1976) contains the highest REE abundances. Both profiles contain negative Eu anomalies [(Eu/Eu*)_N = 0.5-0.61. Rhodes et al. (1976) described 71175 as a Type A Apollo 17 basalt. Gibson et al. (1976) analyzed 71175 for sulphur abundance and reported 1685 ± 30 ugS/g with an equivalent wt% Fe⁰ of 0.182.

Eldridge et al. (1974) reported the primordial radioelement concentrations of 71175 (Table 1). These authors also

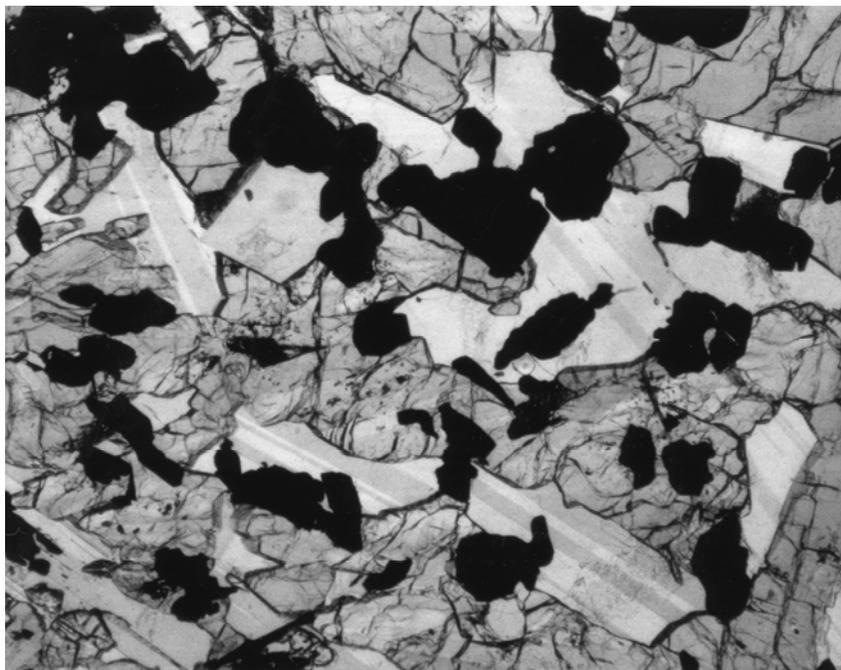


Figure 2: Photomicrograph of 71175,36 dominated by plagioclase, pyroxene, and ilmenite in a sub-ophitic to plagioclase poikilitic texture. Field of view = 2.6 mm.

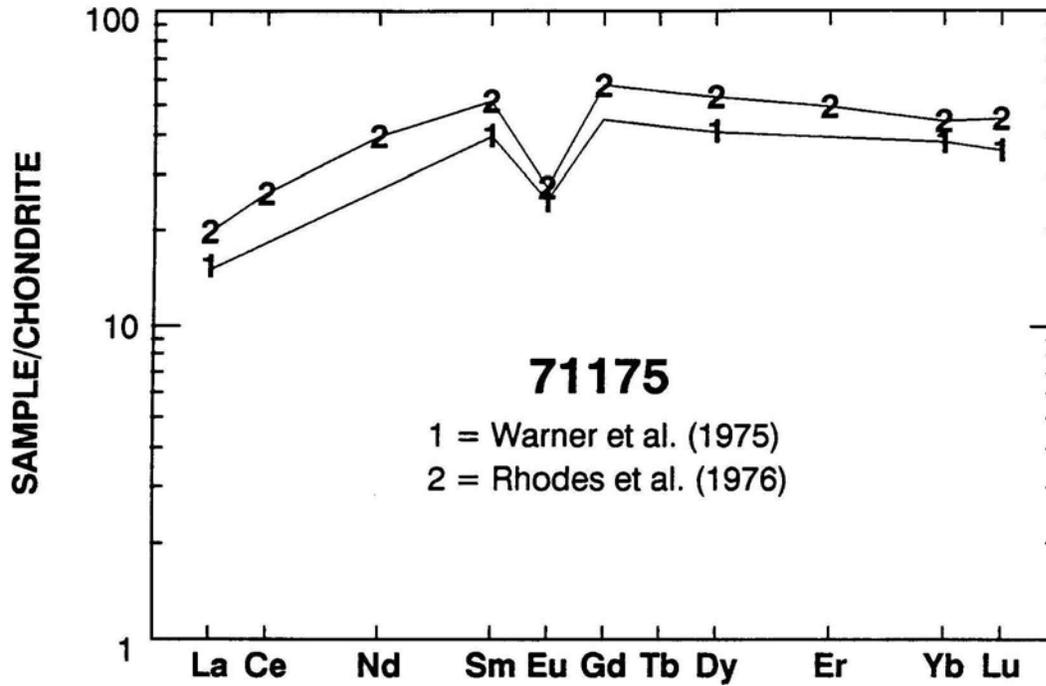


Figure 3: Chondrite -normalized rare-earth element plots for 71175. Data from Warner et al. (1975) and Rhodes et al. (1976).

reported a Th/U ratio of 3.5 and a K/U ratio of 5090 for this sample.

RADIOGENICISOTOPES

Nyquist et al. (1976) reported the whole-rock Rb-Sr isotopic composition of 71175 (Table 2). No age determination was conducted by these authors.

O'Kelley et al. (1974) reported the cosmogenic radionuclide concentrations of 71175 (Table 3).

PROCESSING

Of the original 207.88 of 71175,0, approximately 187.8g remains. Other large (> 1g) sub-samples are, 1(11.93g), 4

(2.930-2 (1.538), and, 8 (1.36g). Five thin sections have been made - ,33-36 and ,39.

Table 1: Whole-rock chemistry of 71175.

	Sample 71175,9 Ref. 1 Method N	Sample 71175,2 Ref. 2 Method X,I,N	Sample 71175 Ref. 3 Method G
SiO ₂ (wt %)		37.93	
TiO ₂	12.7	13.08	
Al ₂ O ₃	9.1	8.47	
Cr ₂ O ₃	0.506	0.54	
FeO	20.5	19.37	
MnO	0.238	0.28	
MgO	10.1	9.63	
CaO	9.2	9.79	
Na ₂ O	0.387	0.38	
K ₂ O	0.059	0.04	
P ₂ O ₅		0.04	
S		0.16	
K(ppm)	552	560 ± 28	
Nb			
Zr			
Hf	8.9		
Ta			
U		0.11 ± 0.01	
Th		0.39 ± 0.02	
W			
Y			
Sr	184		
Rb	0.59		
Li	10.0		
Ba	78.5		
Cs			
Be			
Zn			
Pb			
Cu			
Ni			
Co	21.7	17.6	
V	122		
Sc	78	77	
La	5.0	6.43	
Ce	22.3		
Nd	24.7		

Table 1: (Concluded).

	Sample 71175,9 Ref. 1 Method N	Sample 71175,2 Ref. 2 Method X,I,N	Sample 71175 Ref. 3 Method G
Sm	8.0	10.3	
Eu	1.89	2.08	
Gd	15.7		
Tb			
Dy	14	18.0	
Er		11.0	
Yb	8.3	9.69	
Lu	1.2	1.52	
Ga			
F			
Cl			
C			
N			
H			
He			
Ge (ppb)			
Ir			
Au			
Ru			
Os			

References: 1 = Warner et al. (1975); 2 = Rhodes et al. (1976); 3 = Eldridge et al. (1974).

Analysis by: X = XRF; I = Isotope dilution; N = INAA; G = Gamma-ray spectroscopy.

Table 2: Rb-Sr isotope data from 71175.

Data from Nyquist et al. (1976).

	71175,2
wt(mg)	51
Rb (ppm)	0.587
Sr (ppm)	184
$^{87}\text{Rb}/^{86}\text{Sr}$	0.0092 ± 3
$^{87}\text{Sr}/^{86}\text{Sr}$	0.69971 ± 6
T_B	4.62 ± 0.60
T_L	5.13 ± 0.60

B = Model age assuming $I = 0.69910$ (BABI + JSC bias); C = Model age assuming $I = 0.69903$ (Apollo 16 anorthosites at 4.6 Ga).

Table 3: Concentrations of Cosmogenic Radionuclides (O'Kelley et al., 1974) in 71175.

Cosmogenic Radionuclide Decay corrected to 2300 GMT, Dec. 14, 1972.

	71175
^{26}Al (dpm/Kg)	60 ± 3
^{22}Na	68 ± 4
^{54}Mn	125 ± 8
^{56}Co	120 ± 30
^{46}Sc	43 ± 12