

75015
Ilmenite Basalt
1006 grams



Figure 1: Photo of 75015 showing sap pits on exterior surface. NASA S73-16676. Cube is 1 cm. for scale.

Introduction

Camelot Crater at the Apollo 17 site (650 meter diameter) had an abundance of rocks in the rim extending down into the crater (Wolfe et al. 1981). Sample 75015 was chipped from one of the smaller boulders, 75035 and 75055 from others (see excerpt

of transcript in 75035). These samples are similar and also, remarkably, similar to the ophitic Apollo 11 samples from many kilometers away.



Figure 2: Thin section photomicrograph of 75015. Field of view is 3 cm. NASA S76-29483.

75015 is a vuggy ilmenite basalt with only a few micrometeorite craters (figure 1). It has not been carefully studied and no age is available.

Mineralogy

No detailed mineral data are reported.

Petrography

Brown et al. (1975) give the modal mineralogy for 75015 and found trace olivine (see table). Neal and Taylor (1993) described it as a coarse-grained (1-2 mm) ophitic basalt with pink pyroxene, plagioclase and ilmenite crystals up to 2 mm in length (figure 2). Silica is the most abundant accessory mineral.

Mineralogical Mode of 75015

	Brown et al. 1975
Olivine	0.2
Pyroxene	50.7
Plagioclase	28.6
Ilmenite	16.7
Silica	3.4
Mesostasis	0.4

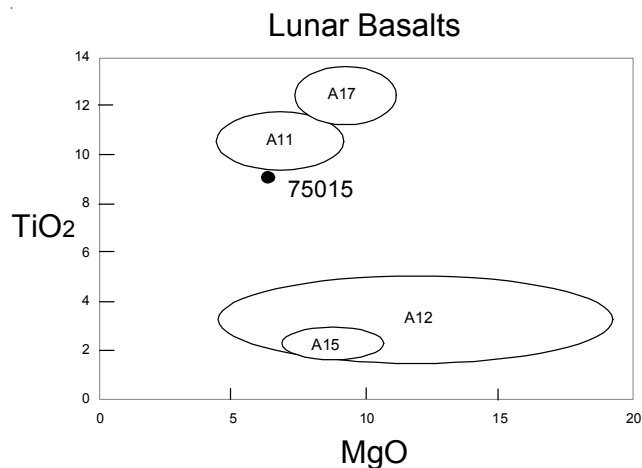


Figure 3: Composition of 75015 compared with that of other lunar basalts.

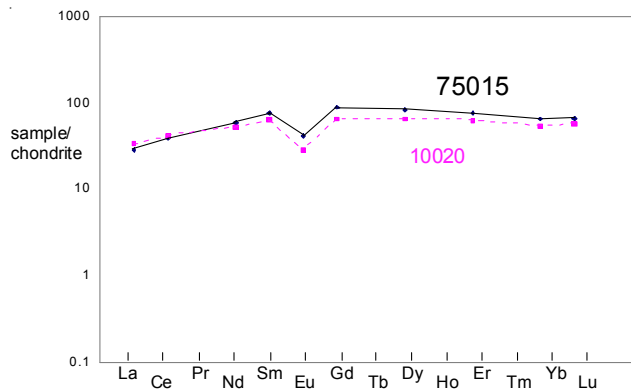


Figure 4: Normalized rare-earth-element diagram for 75015 compared with that of Apollo 11 sample (data from Rhodes et al. 1976).

Chemistry

The chemical composition of 75015 has been determined by Rhodes et al. (1976) and Warner et al. (1975). It is generally similar to Apollo 11 sample 10020 (figures 3 and 4). Gibson et al. (1976) reported 2205 ppm sulfur. Paces et al. (1991) classify it as a type A, Apollo 17 basalt (see figure 5).

Radiogenic age dating

Nyquist et al. (1976) reported Rb, Sr and $^{87}\text{Sr}/^{86}\text{Sr}$ for sample 75015, but it has not been dated, presumably because it is similar to 75035 and 75055.

Cosmogenic isotopes and exposure ages

Arvidson et al. (1976) reported a cosmic ray exposure age of 92 ± 4 m.y. (determined by Niemeyer using ^{81}Kr technique).

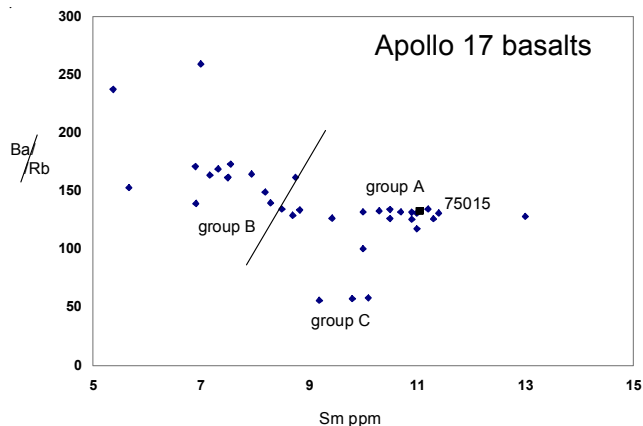


Figure 5: 75015 is a group A, Apollo 17 basalt.

Processing

Two pieces of 75015 are used for public display (figure 6). There are 5 thin sections.

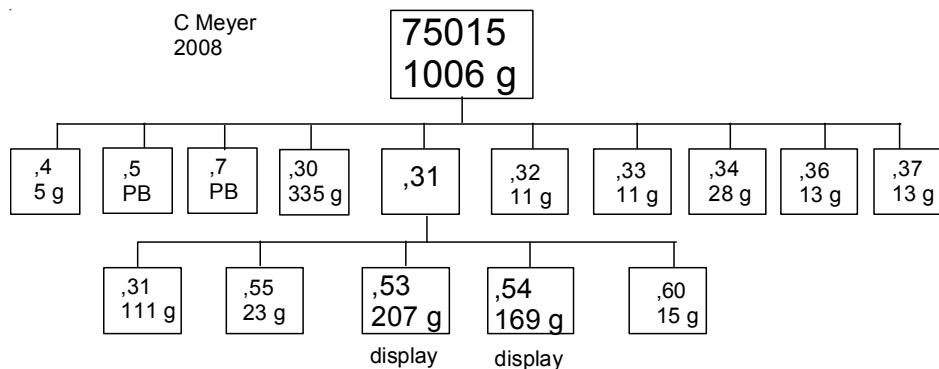


Table 1. Chemical composition of 75015.

reference weight	Wiesmann 75 Nyquist 76	Rhodes 76	Warner 75	
SiO ₂ %		41.92	(b)	
TiO ₂		9.56	(b) 8.7	(c)
Al ₂ O ₃		10.06	(b) 9.9	(c)
FeO		18.77	(b) 21.2	(c)
MnO		0.29	(b) 0.26	(c)
MgO		6.2	(b) 5.4	(c)
CaO		12.15	(b) 11.6	(c)
Na ₂ O		0.48	(b) 0.47	(c)
K ₂ O	0.074	(a) 0.06	(b) 0.05	(c)
P ₂ O ₅		0.05	(b)	
S %		0.2	(b)	
sum				
Sc ppm		77	(b) 79	(c)
V			24	(c)
Cr		1490	(b) 822	(c)
Co		14.7	(b) 15.2	(c)
Ni				
Cu				
Zn				
Ga				
Ge ppb				
As				
Se				
Rb	0.646	(a) 0.65		
Sr	215	(a) 215		
Y				
Zr				
Nb				
Mo				
Ru				
Rh				
Pd ppb				
Ag ppb				
Cd ppb				
In ppb				
Sn ppb				
Sb ppb				
Te ppb				
Cs ppm				
Ba	87.5	(a) 87.5		
La	6.74	(a) 6.74	12.2	(c)
Ce	23.8	(a) 23.8		
Pr				
Nd	26.5	(a) 26.5		
Sm	11.2	(a) 11.2	16.7	(c)
Eu	2.34	(a) 2.34	3.15	(c)
Gd	17.7	(a) 17.7		
Tb				
Dy	20.1	(a) 20.1	29	(c)
Ho				
Er	12.2	(a) 12.2		
Tm				
Yb	10.8	(a) 10.8	15.6	(c)
Lu		1.62	2.2	(c)
Hf		9.6		
Ta				
W ppb				
Re ppb				
Os ppb				
Ir ppb				
Pt ppb				
Au ppb				
Th ppm				
U ppm				

technique: (a) IDMS, (b) XRF, (c) INAA



Figure 6: Sample 75015,53 on display at the Tycho Brache Planetarium in Copenhagen. NASA S-91-36670.

References for 75015

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