

70255
Ilmenite Basalt
277.2 grams



Figure 1: Color photo of fine-grained basalt 70255. Cube is 1 cm. NASA S75-24191.

Introduction

70255 is a fine-grained Ti-rich basalt. It was collected from the ALSEP site, near the LM.

70255 is an oriented sample, because half is angular and free of zap pits, while the other half is rounded with numerous zap pits.

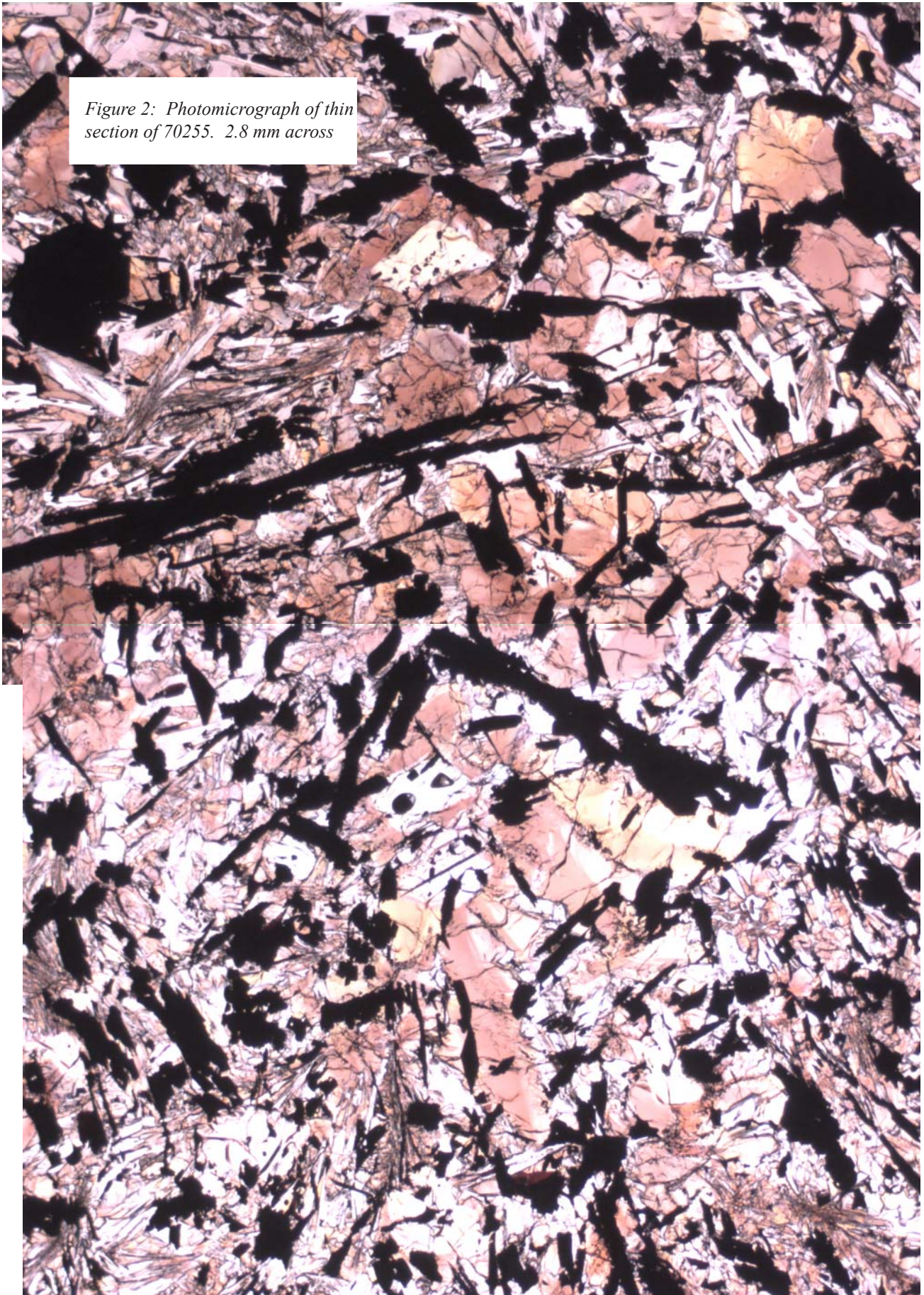
Petrography

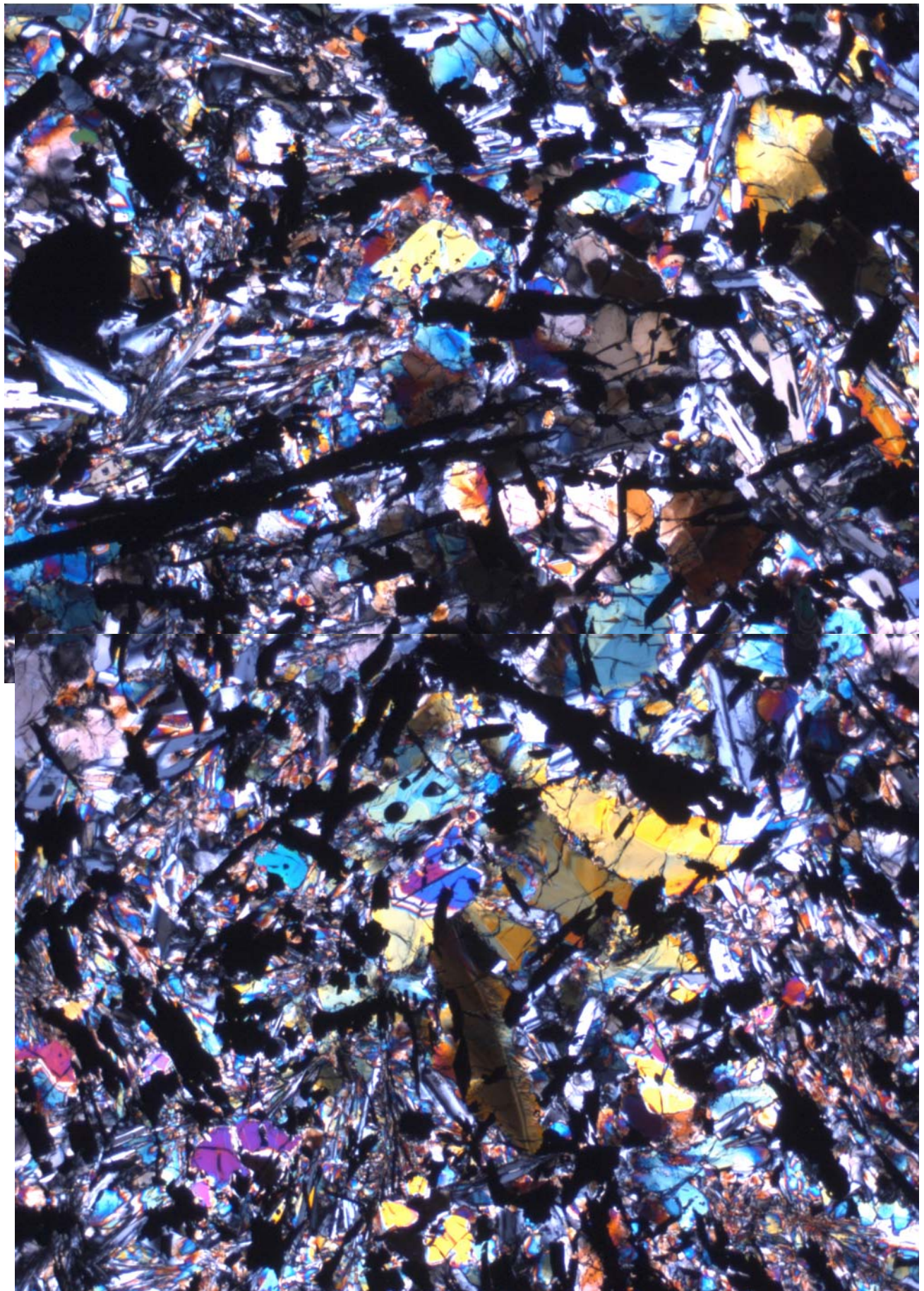
Neal and Taylor (1993) reviewed the information on 70255. It is a blocky, subangular, homogeneous basalt with 1-2 % vugs. It contains both olivine and silica as

Mineralogical Mode of 70255

	Brown et al. 1975
Olivine	5 vol. %
Pyroxene	47.7
Plagioclase	14.8
Opakes	30.9
Silica	1.6

Figure 2: Photomicrograph of thin section of 70255. 2.8 mm across





a consequence of rapid crystallization. Usselman et al. (1975) calculated the cooling rate is 2 – 5 deg/hr.

Chemistry

Warner et al. (1975a) and Rhodes et al. (1976) determined the chemical composition (table 1).

Keith et al. (1974) determined K, U and Th by radiation counting. Lindstrom and Haskin (1978) find it is a type A.

Radiogenic age dating

Nyquist et al. (1976) determined Rb, Sr and ⁸⁷Sr/⁸⁶Sr for whole rock, but didn't report an age.

Schaeffer and Schaeffer (1977) determined an old age – older than other A17 samples (figure 5). Paces et al. (1991) listed it as type A (perhaps similar to 70215).

Cosmogenic isotopes and exposure ages

Keith et al. (1974) determined the cosmic ray induced activity of 70255 as ²⁶Al = 49 dpm/kg., ²²Na = 72 dpm/kg., ⁵⁴Mn = 137 dpm/kg., ⁵⁶Co = 211 dpm/kg. and ⁴⁶Sc = 63 dpm/kg.

List of Photo #s for 70255

- S73-21974 orientation
- S73-24191 processing
- S73-16042 – 049 color
- S73-24088 – 24103 B&W
- S76-21639
- S76-21643
- S76-21650

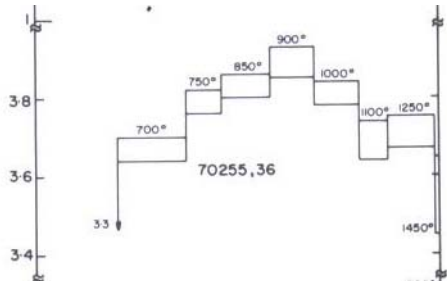


Figure 5: Ar - Ar plateau for 70255 by Schaeffer and Schaeffer 1976.

Summary of Age Data for 70255

Schaeffer and Schaeffer 1977 Ar/Ar
 3.84 ± 0.02 b.y.
Note: Old decay constant

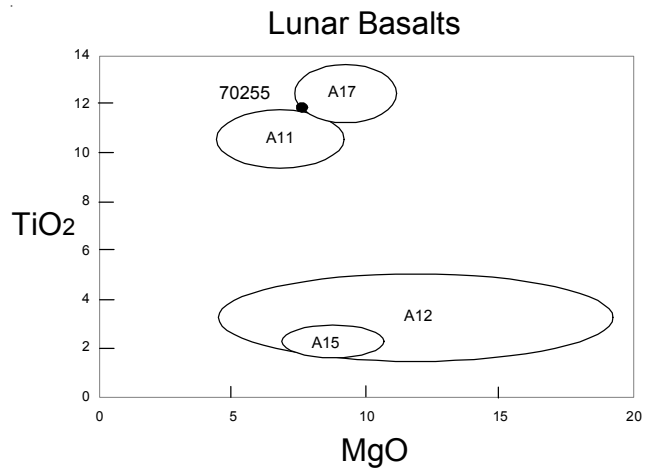


Figure 3: Composition of Apollo basalts with 70255.

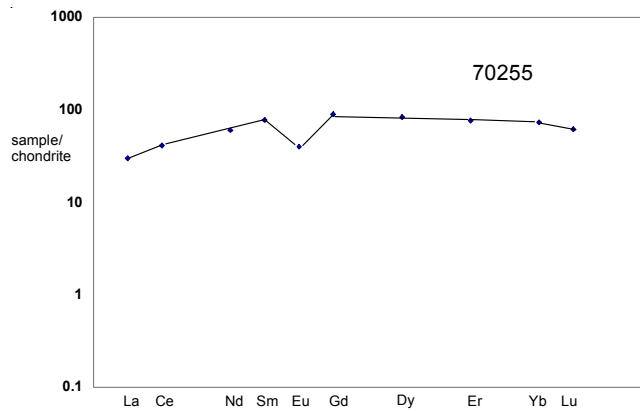


Figure 4: Normalized rare-earth-element diagram for 70255 (data from Rhodes et al. 1976).

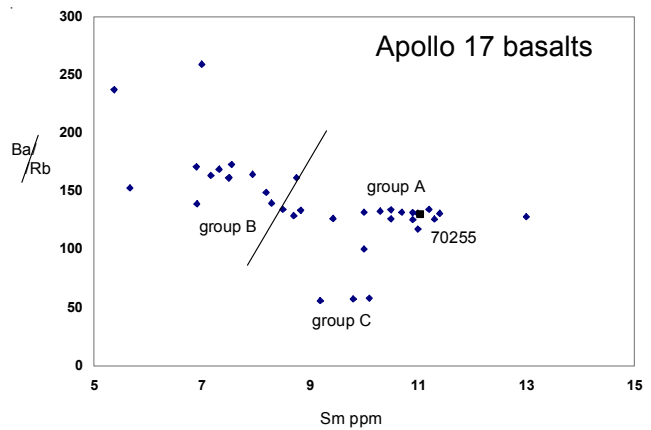
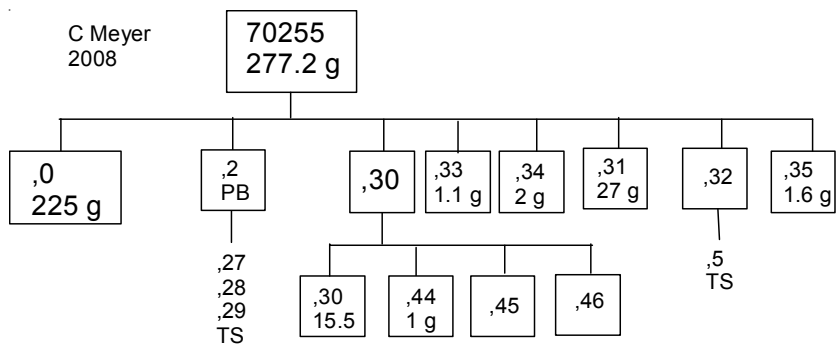


Figure 6: Trace element plot of Apollo 17 basalts showing 70255 is type A.

Table 1. Chemical composition of 70255

<i>reference weight</i>	Rhodes76	Keith 74	Warner75 Hughes85	
SiO ₂ %	40.11	(a)		
TiO ₂	11.41	(a)	11.3	(b)
Al ₂ O ₃	9.02	(a)	9.1	(b)
FeO	18.73	(a)	20.3	(b)
MnO	0.29	(a)	0.249	(b)
MgO	7.63	(a)	8	(b)
CaO	11.3	(a)	10.6	(b)
Na ₂ O	0.39	(a)	0.387	(b)
K ₂ O	0.05	(a)	0.048	(d)
P ₂ O ₅	0.04	(a)	0.077	(b)
S %	0.19	(a)		
<i>sum</i>				
Sc ppm	80	(b)	90	(b)
V			76	(b)
Cr	2860	(b)		
Co	17.5	(b)	19.5	(b)
Ni				
Cu				
Zn				
Ga				
Ge ppb				
As				
Se				
Rb	0.65	(c)		
Sr	199	(c)		
Y				
Zr			276	(e)
Nb				
Mo				
Ru				
Rh				
Pd ppb				
Ag ppb				
Cd ppb				
In ppb				
Sn ppb				
Sb ppb				
Te ppb				
Cs ppm				
Ba	85.3	(c)		
La	7.05	(c)	6.4	(b)
Ce	24.7	(c)		
Pr				
Nd	27.3	(c)		
Sm	11.4	(c)	10	(b)
Eu	2.23	(c)	2.2	(b)
Gd	17.6	(c)		
Tb				
Dy	20.2	(c)	18	(b)
Ho				
Er	12.1	(c)		
Tm				
Yb	11.8	(c)	10	(b)
Lu	1.48	(c)	1.4	(b)
Hf	9.7	(b)	9.6	(e)
Ta				
W ppb				
Re ppb				
Os ppb				
Ir ppb				
Pt ppb				
Au ppb				
Th ppm		0.31	(d)	
U ppm		0.107	(d)	

technique (a) XRF, (b) INAA, (c) IDMS, (d) radiation counting



*Figure 7: Original photo of 70255 showing large micrometeorite crater. Scale is in cm.
NASA S73-24101.*

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