

72155
Ilmenite Basalt
238.5 grams



Figure 1: Photo of freshly broken side of 72155. Cube is 1 cm. NASA S73-16918.

Introduction

Basalt sample 72155 was picked up from the mare surface near the edge of the light mantle deposit (see section on 72150). It has a few micrometeorite pits on rounded surfaces, and has numerous vugs and cavities lined with crystals. Detailed mineral analyses and absolute age dating have not been reported.

Petrography

Brown et al. (1975) reported the mineral mode. There is very little plagioclase. The texture is microporphritic with both olivine and abundant ilmenite phenocrysts set in holocrystalline groundmass (figure 6). The average grain size is about 0.5 mm with a few ilmenite blades up to 1 mm.

Mineralogical Mode for 72155

	Brown et al. 1975
Olivine	3.5
Pyroxene	42.8
Plagioclase	14.7
Opakes	38.6
Silica	0.4
Mesostasis	-

Chemistry

The chemical composition of 72155 has been reported by Laul et al. (1974), Shih et al. (1975), Boynton et al. (1975), Wanke et al. (1975), Rhodes et al. (1976) and Eldridge et al. (1975) (table 1, figures 4 and 5). If you classify basalts by trace elements, this would be a type A basalt.



Figure 2: Photo of 72155 illustrating zap pits. Cube is 1 cm. NASA S73-18234.

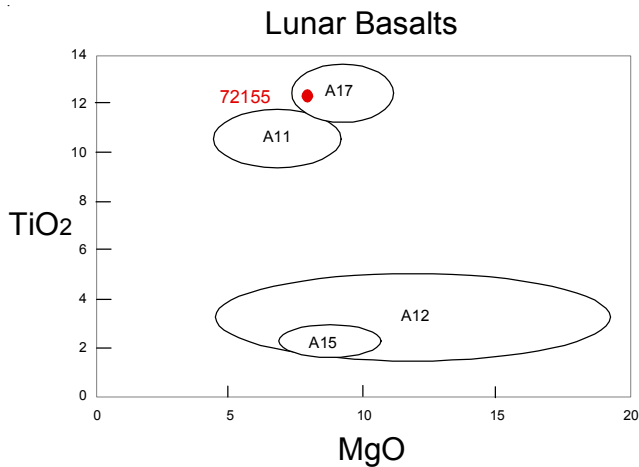


Figure 3: Composition of 72155 compared with other Apollo basalts.

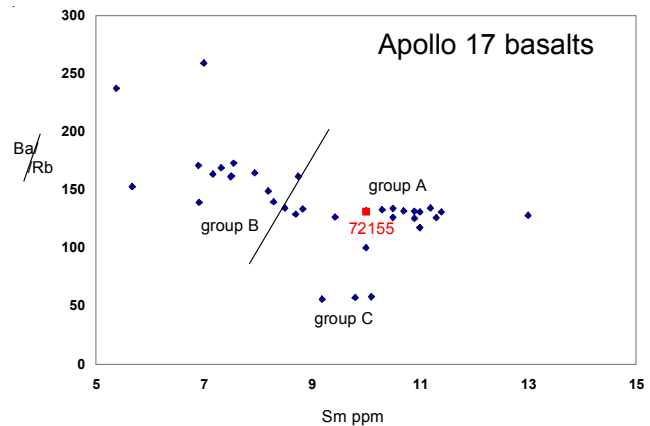


Figure 4: Classification of Apollo 17 basalts.

Radiogenic age dating

Nyquist et al. (1975) and Nunes et al. (1974) reported the isotopic composition of Sr and Pb, respectively. Apollo 17 mare basalts are generally considered 3.72 ± 0.04 b.y. old (see Paces et al. 1991).

Cosmogenic isotopes and exposure ages

Eldridge et al. (1975) determined the cosmic-ray-induced activity of $^{22}\text{Na} = 68$ dpm/kg, $^{26}\text{Al} = 54$ dpm/kg, and $^{54}\text{Mn} = 125$ dpm/kg.

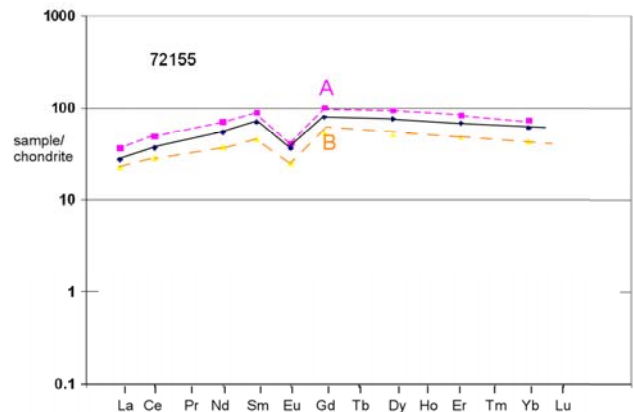
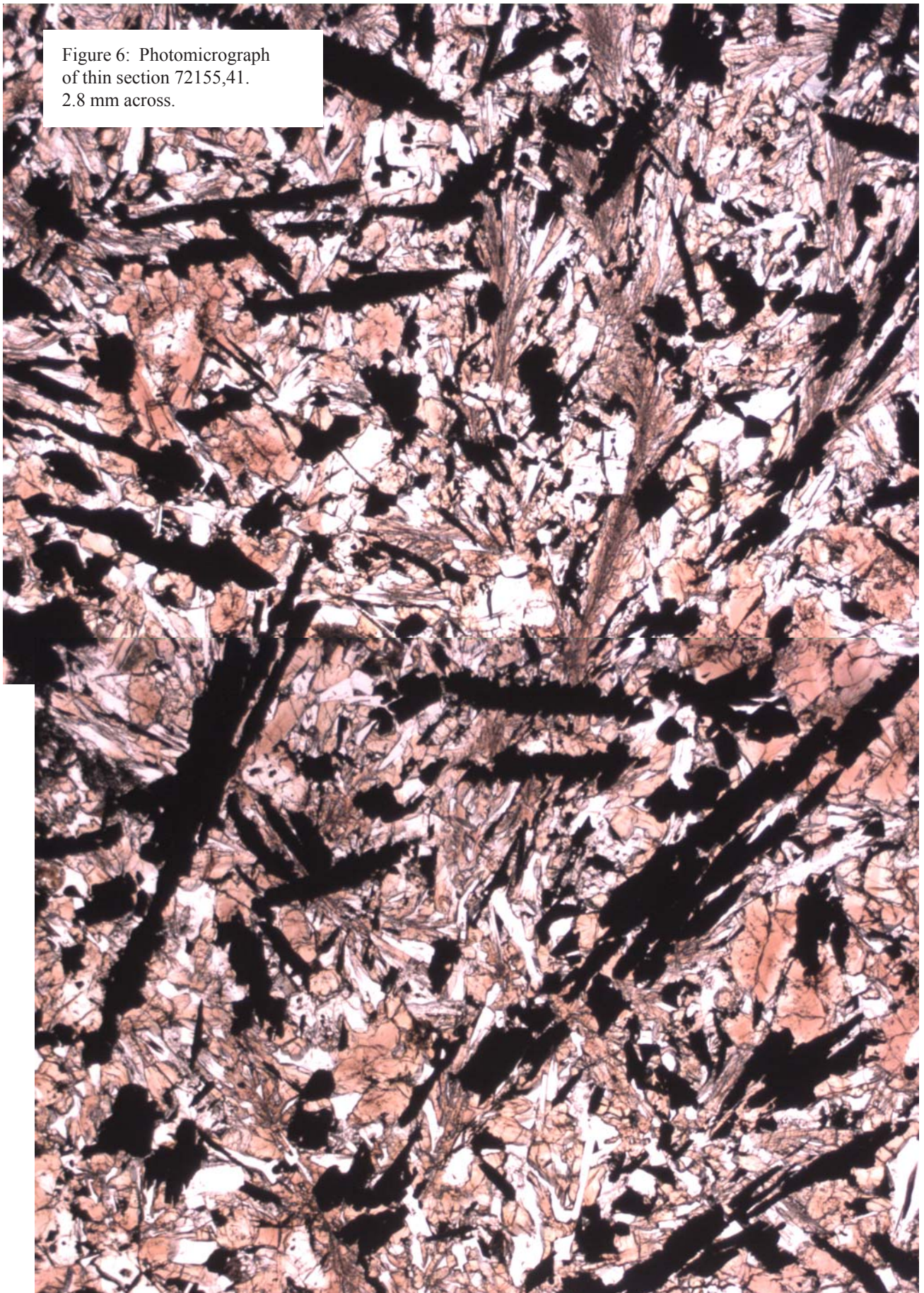


Figure 5: Normalized rare-earth-element diagram for 72155 compared with A and B types of Apollo 17 basalt.

Figure 6: Photomicrograph
of thin section 72155,41.
2.8 mm across.



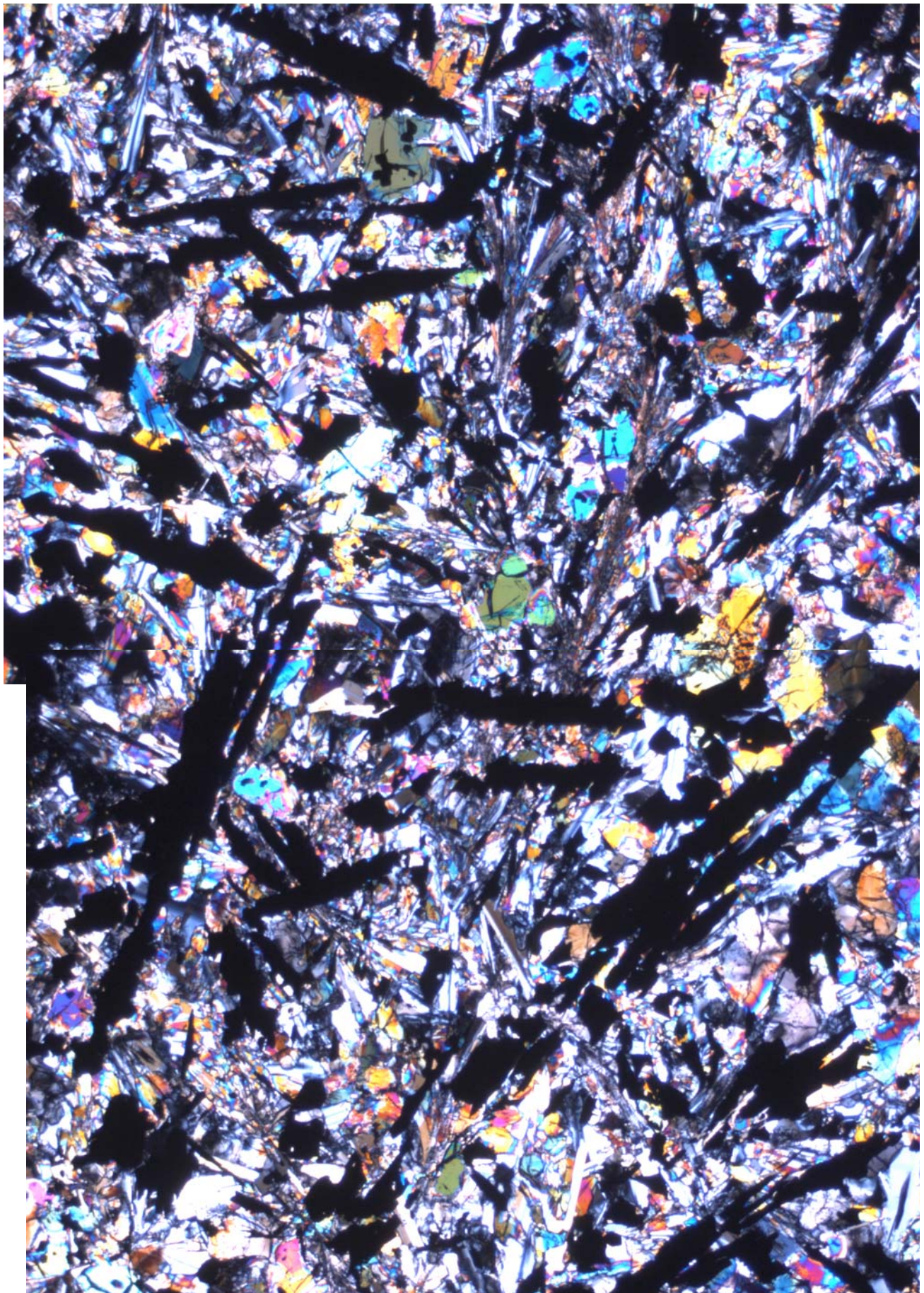


Table 1. Chemical composition of 72155.

reference weight	Eldridge75	Shih75 Rhodes75	Laul74	Wanke75	Boynton75
SiO2 %		38.67 (e)		38.95 (d)	
TiO2		12.32 (e)	12.1 (c)	12.2 (d)	12.3 (c)
Al2O3		8.64 (e)	8 (c)	8.54 (d)	8.88 8.5 (c)
FeO		18.77 (e)	18.6 (c)	19.4 (d)	17.4 18.5 (c)
MnO		0.28 (e)	0.234 (c)	0.25 (d)	0.25 0.26 (c)
MgO		8.47 (e)	9 (c)	8.72 (d)	
CaO		10.69 (e)	10.4 (c)	10.4 (d)	9.24 10.9 (c)
Na2O		0.4 (e)	0.4 (c)	0.38 (d)	0.43 0.4 (c)
K2O	0.063 (a)	0.067 (b)	0.072 (c)	0.067 (d)	
P2O5		0.05 (e)		0.135 (d)	
S %		0.15 (e)			
sum					
Sc ppm		83 (c)	80 (c)	84 (c)	77 80 (c)
V			100 (c)		
Cr		2942 (e)		3200 (d)	2910 3110 (c)
Co		19 (c)	20 (c)	19.5 (c)	20 20 (c)
Ni					
Cu					
Zn					
Ga					
Ge ppb					
As					
Se					
Rb		0.609 (b)			
Sr		180 (b)		195 (c)	
Y				93 (c)	
Zr		267 (b)		271 (c)	
Nb				22 (c)	
Mo					
Ru					
Rh					
Pd ppb					
Ag ppb					
Cd ppb					
In ppb					
Sn ppb					
Sb ppb					
Te ppb					
Cs ppm					
Ba		78.1 (b)	90 (c)	85 (c)	100 7.3 (c)
La		6.38 (b)	7.2 (c)	7.08 (c)	6.5 7.3 (c)
Ce		22.1 (b)	26 (c)	27.5 (c)	33 35 (c)
Pr					
Nd		24.4 (b)	32 (c)	28 (c)	
Sm		10.2 (b)	10.2 (c)	10.8 (c)	10.2 11.2 (c)
Eu		2.02 (b)	2 (c)	2.19 (c)	2 2.1 (c)
Gd		15.6 (b)			
Tb			3 (c)	2.7 (c)	2.1 2.8 (c)
Dy		18.3 (b)	18 (c)	20.5 (c)	16 16 (c)
Ho				4.5 (c)	
Er		10.8 (b)			
Tm					
Yb		9.77 (b)	10 (c)	10.7 (c)	9.5 10.4 (c)
Lu			1.5 (c)	1.44 (c)	1.37 1.48 (c)
Hf			8.7 (c)	8.82 (c)	8.6 9 (c)
Ta			1.6 (c)	1.78 (c)	2.2 (c)
W ppb					
Re ppb					
Os ppb					
Ir ppb					
Pt ppb					
Au ppb					Nunes
Th ppm	0.36 (a)		0.3 (c)		0.388 (b)
U ppm	0.13 (a)	0.12 (b)			0.118 (b)

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

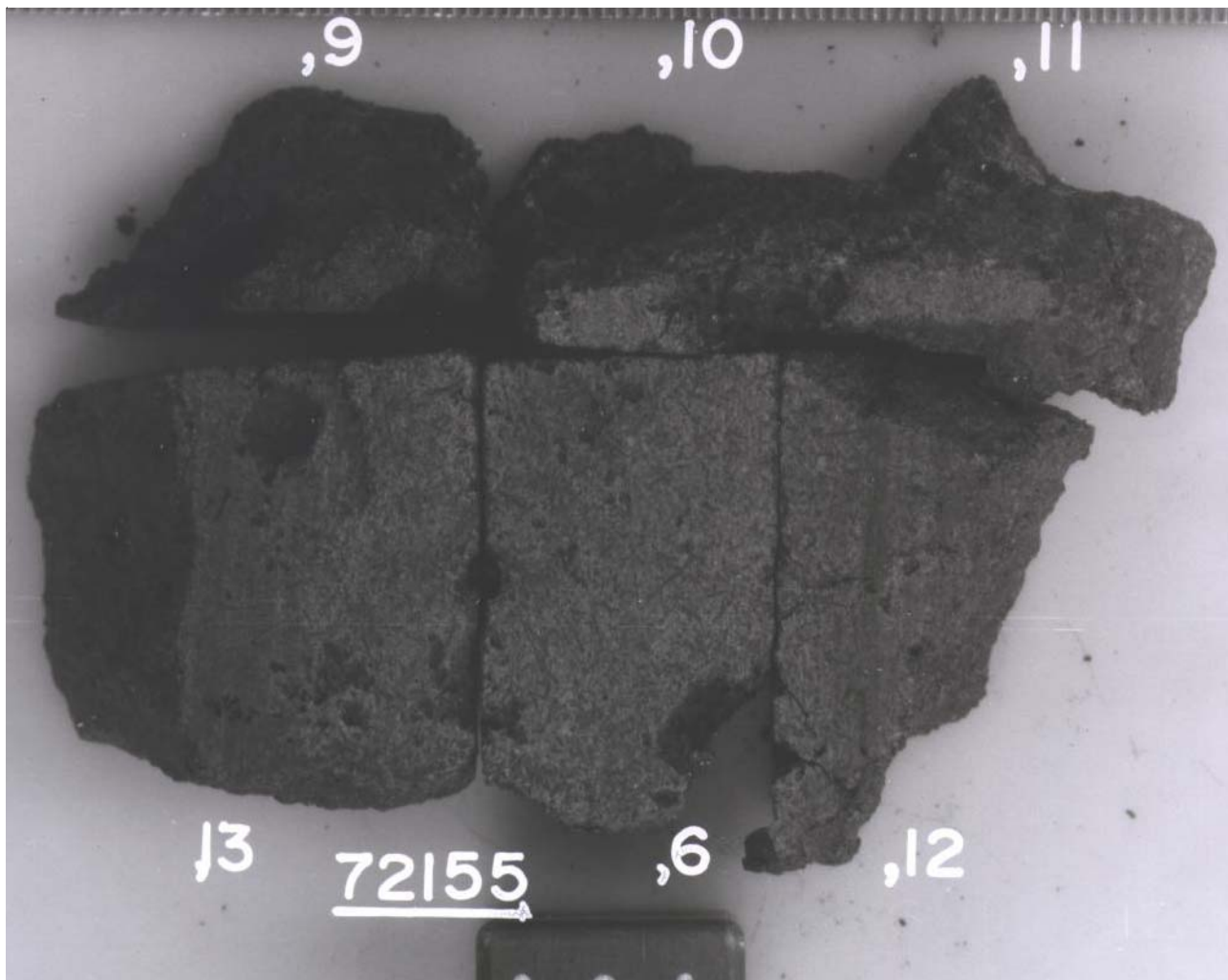
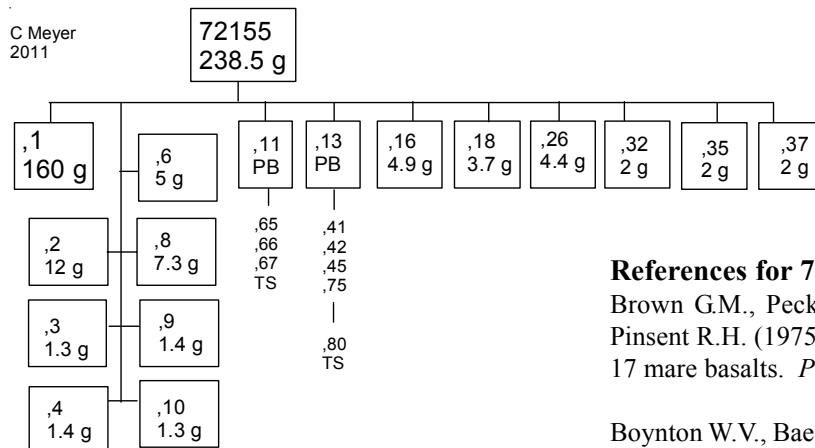


Figure 7: Slab cut from 72155.



Processing

Subdivision of 72155 is shown in figures 7 and 8. There are 12 thin sections.

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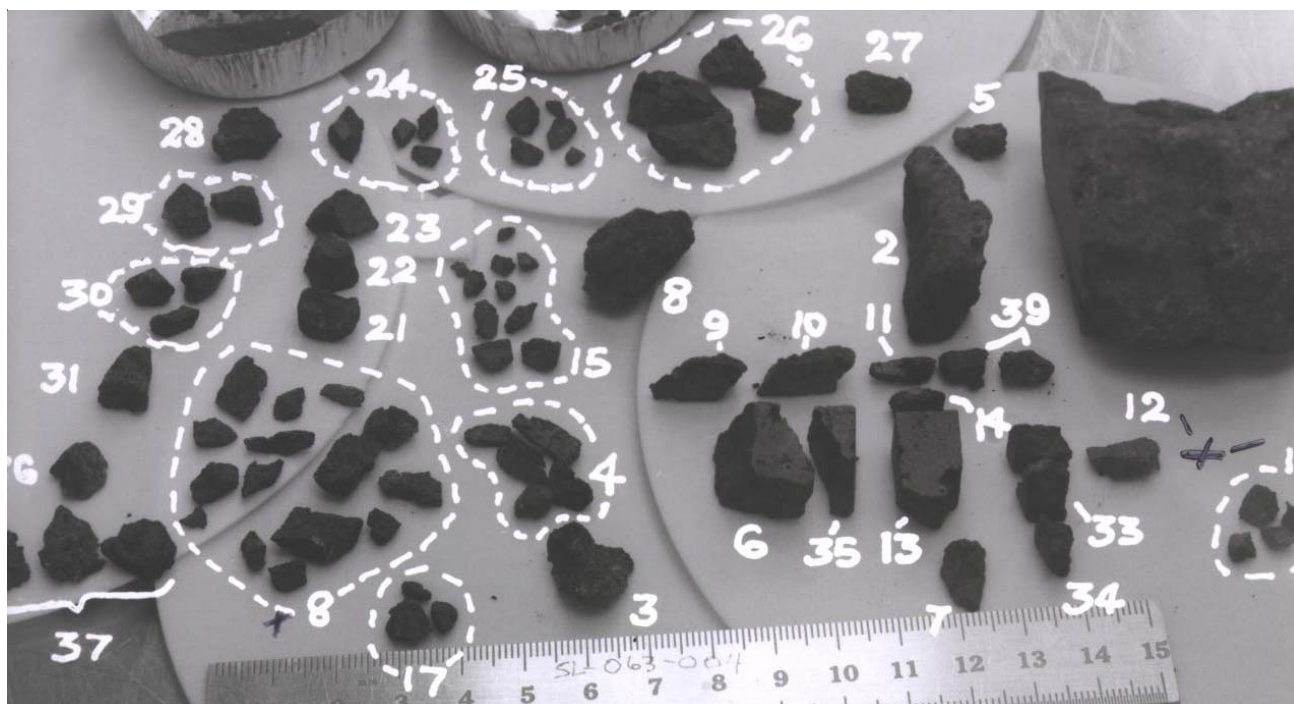


Figure 8: Group photo of processing of 72155. NASA S74-19026. Scale is cm.

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