72155

Ilmenite Basalt

238.5 grams

Figure 1: Photo of freshly brokne 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
Opaques	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.

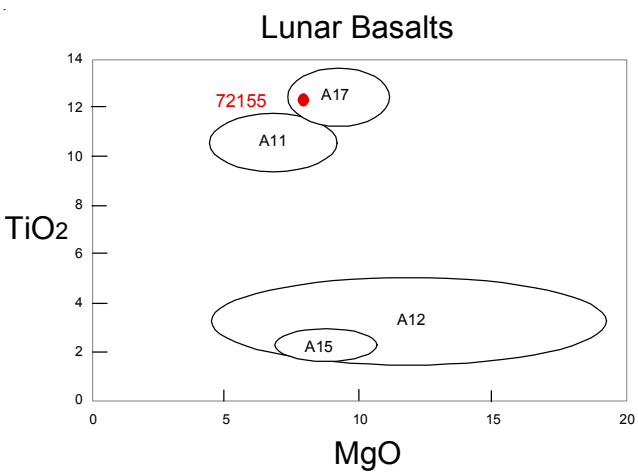


Figure 3: Composition of 72155 compared with other Apollo basalts.

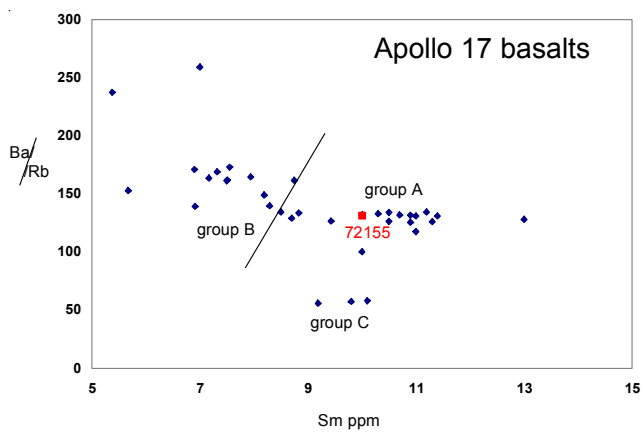


Figure 4: Classification of Apollo 17 basalts.

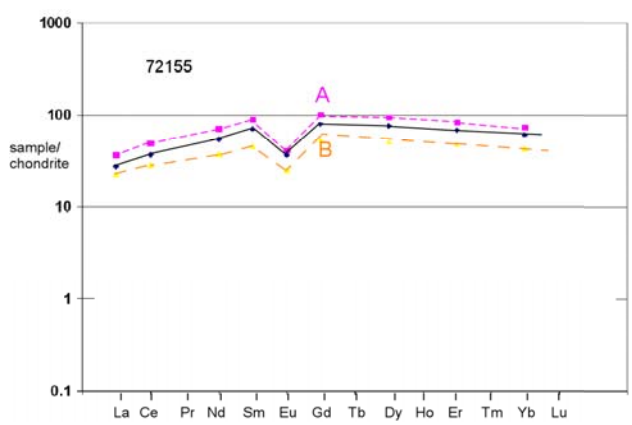


Figure 5: Normalized rare-earth-element diagrsam for 72155 compared with A and B types of Apollo 17 basalt.

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}Na = 68 dpm/kg, ^{26}Al = 54 dpm/kg, and ^{54}Mn =125 dpm/kg.

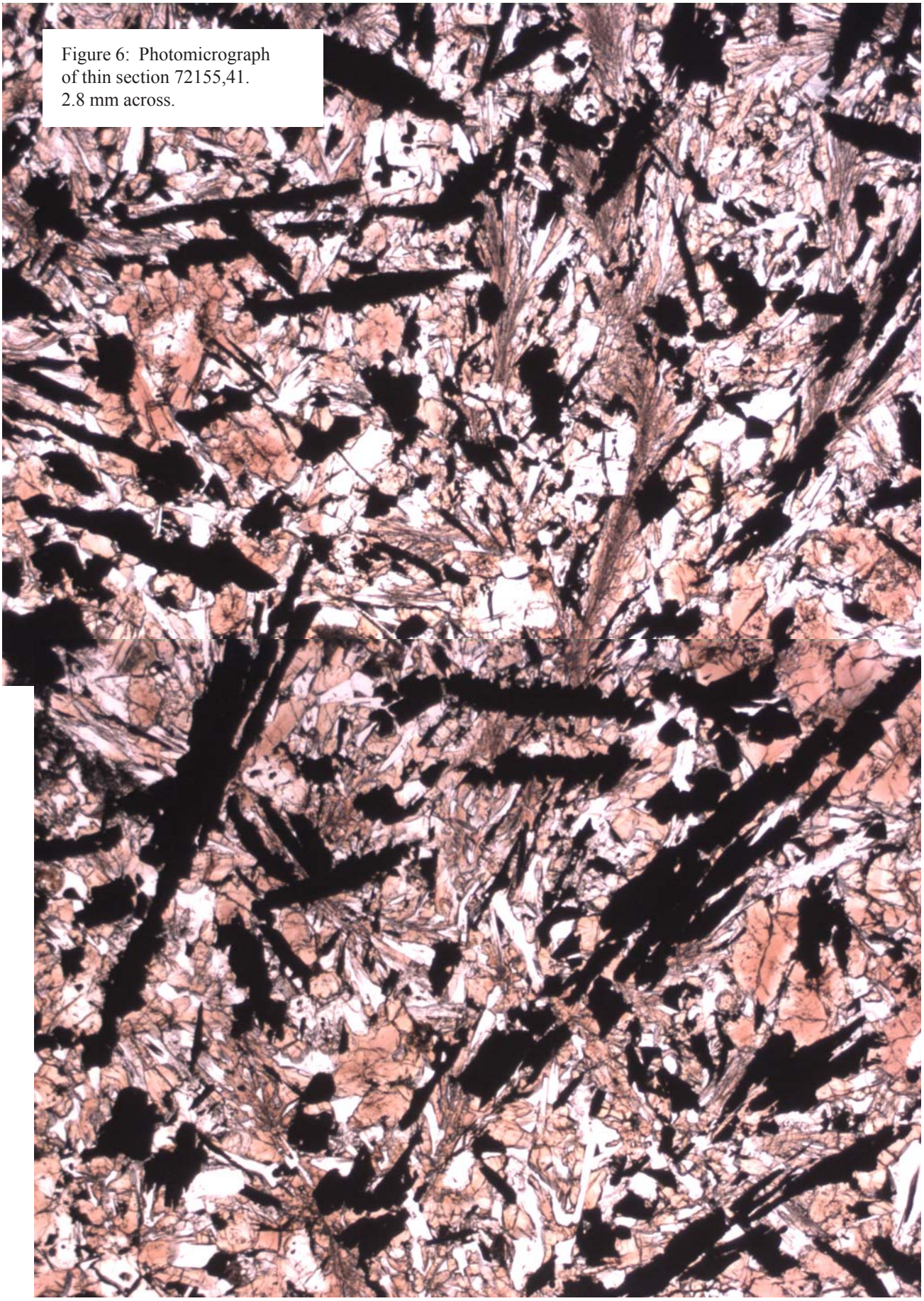


Figure 6: Photomicrograph of thin section 72155,41. 2.8 mm across.

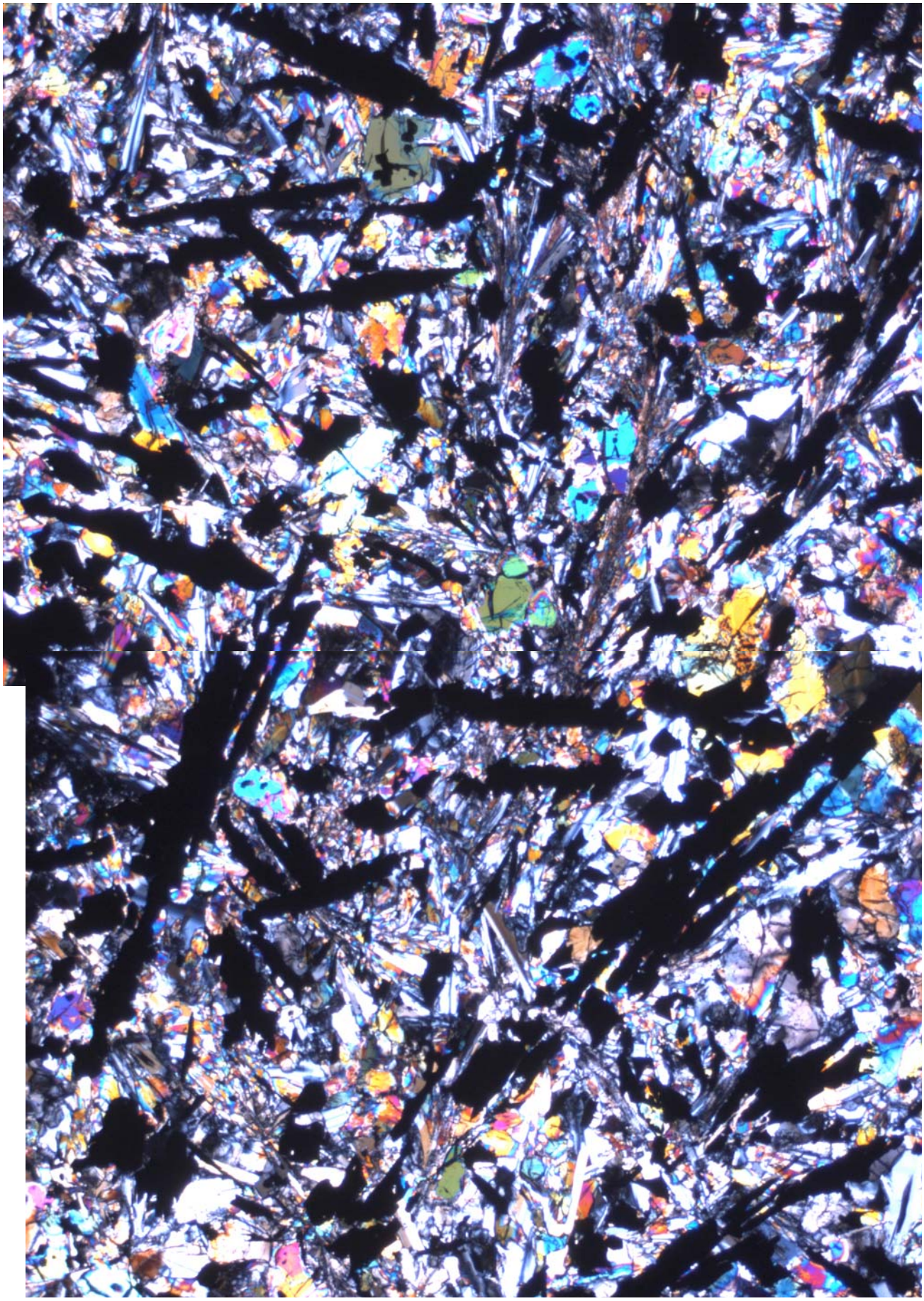


Table 1. Chemical composition of 72155.

reference	Eldridge75		Shih75		Laul74		Wanke75			Boynton75	
weight			Rhodes75								
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	(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	(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

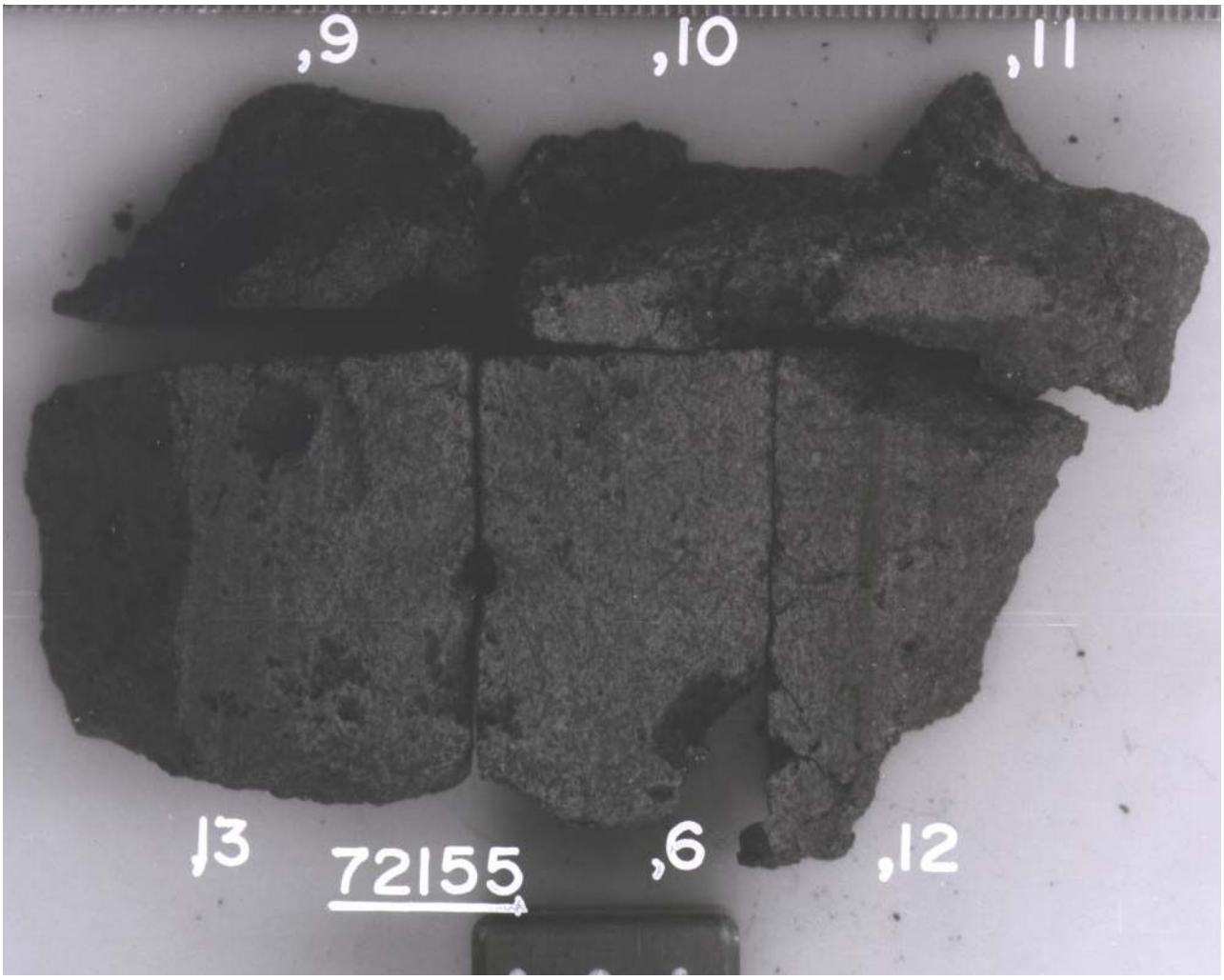
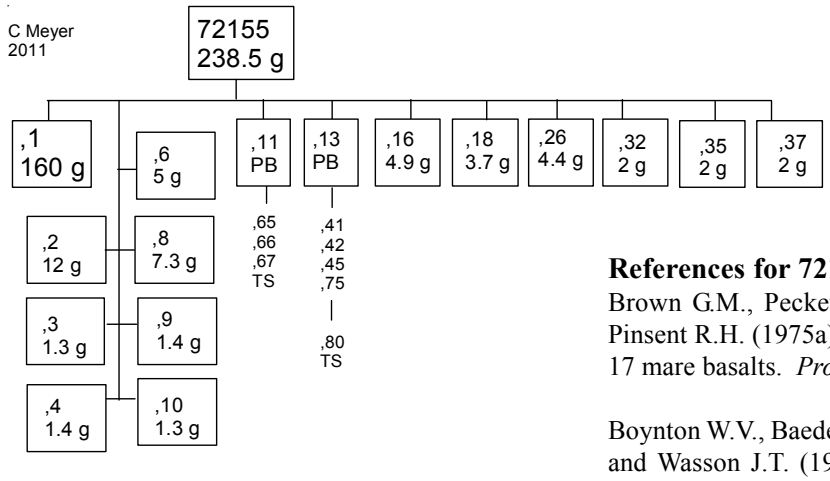


Figure 7: Slab cut from 72155.



Processing

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

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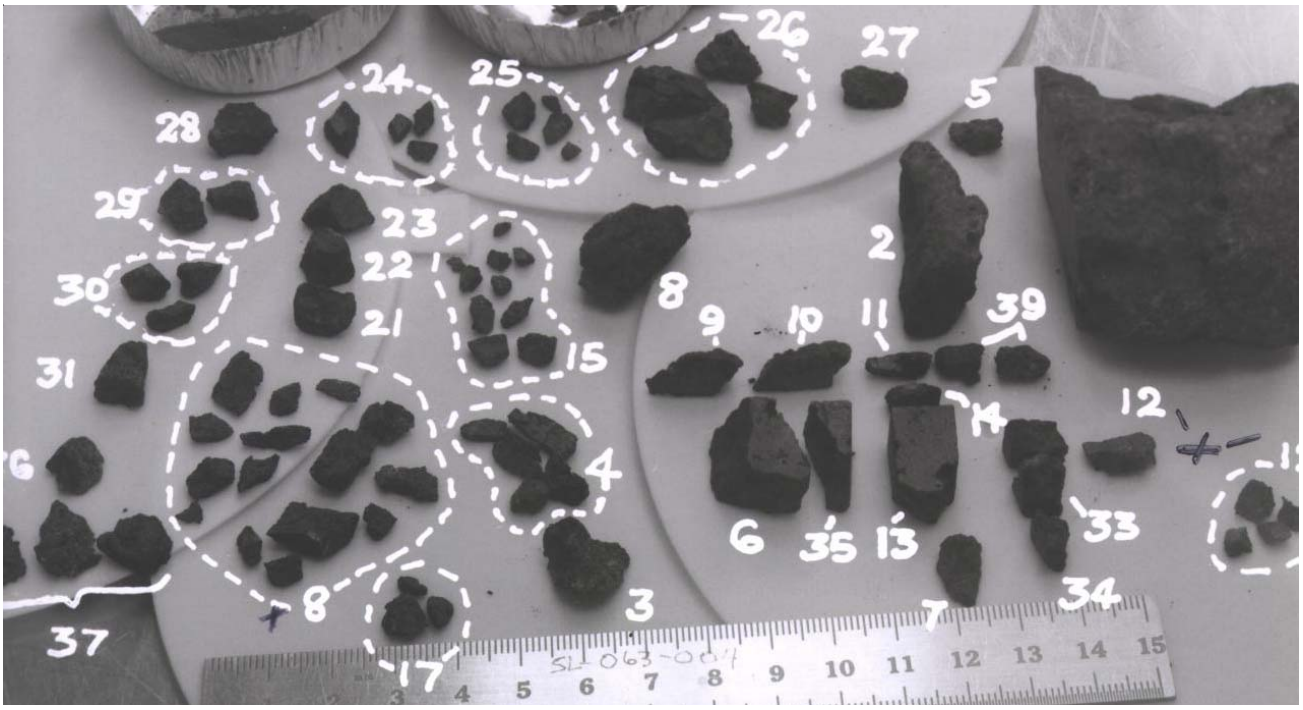

Figure 8: Group photo of processing of 72155. NASA S74-19026. Scale is cm.

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