

70175
Breccia (cinder)
339.6 grams



Figure 1: Photo of 70175. S73-15345 Cube is 1 cm.



Figure 2: View of area where 70175 was collected.

Mineralogical Mode for 70175

(Simon et al. 1990)

Matrix	63.1 %	
	20-90 micron	90-100 micron
Mare Basalt		0.6
KREEP Basalt		
Feld. Basalt		
Plutonic		0.1
Granulitic		
Breccia	0.5	1.1
Olivine	0.7	0.2
Pyroxene		
Plagioclase		
Opaques		
Glass	23.5	11.3
Agglutinate	0.2	0.3

Introduction

70175 was collected near the deep drill at the ALSEP site, Apollo 17 (figure 2). It has a high proportion of “orange glass” and appears to be “unusual”.

This rock was found to have high cosmic-ray-induced activity (i.e saturated). There is one large zap pit (figure 3).

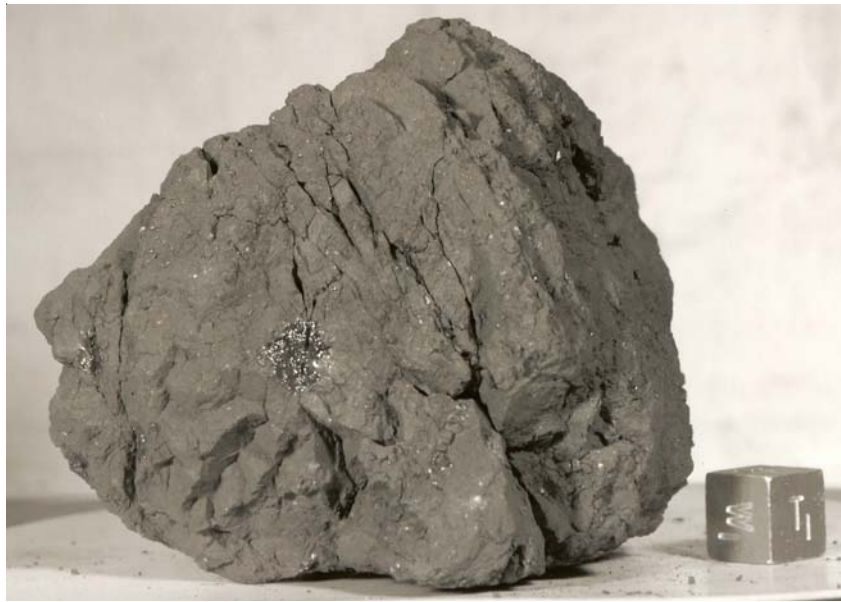


Figure 3: End view of 70175 showing large glass splash.
Cube is 1 cm. S73-24850

Could this sample be a piece of the “dark mantle?” It surely is dark enough!

Petrography

Fruland (1983) included 70175 in the samples to be studied by the Regolith Breccia Initiative. Simon et al. (1990) and Shearer et al. (1993) found a high percentage of “orange glass” in 70175. The glass includes spheres, shards, veins and matrix. Much of the glass is devitrified, making it appear black (figure 4).

Fruland (1983) provides the only description: “This unusual breccias is orange- and black-glass-rich. The matrix is compact, with low porosity, and appears to be composed of orange and black glass spheres and shards; mineral fragments (mafic and plagioclase clasts are identifiable), and a black aphanitic lithology. The matrix color is basic black, the overall thin section color is red-black. There are no recognizable agglutinates. In addition to the orange and black glass spheres and shards, there are veins and clasts of clast-rich yellow-orange glass. Ilmenite is present, but is very fine-grained and skeletal”.

The maturity index I_s/FeO , rare gas content, carbon or nitrogen content can not be found in the literature!

Chemistry

Simon et al. (1990) determined that this sample had high TiO_2 , high FeO and low Al_2O_3 (figure 5). However, it is not known if this analysis is representative of the whole. Let’s wait for Randy Korotev’s analysis.

Cosmogenic isotopes and exposure ages

Keith et al. (1974) determined the cosmic-ray-induced activity of $^{22}Na = 76$ dpm/kg, $^{26}Al = 42$ dpm/kg, $^{46}Sc = 39$ dpm/kg, $^{48}V = 17$ dpm/kg, $^{54}Mn = 156$ dpm/kg, and $^{56}Co = 300$ dpm.

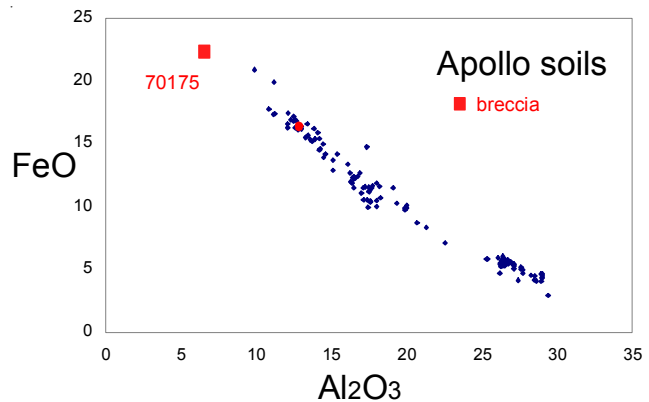


Figure 5: Comparison of composition of 70175 with that of Apollo soil samples.

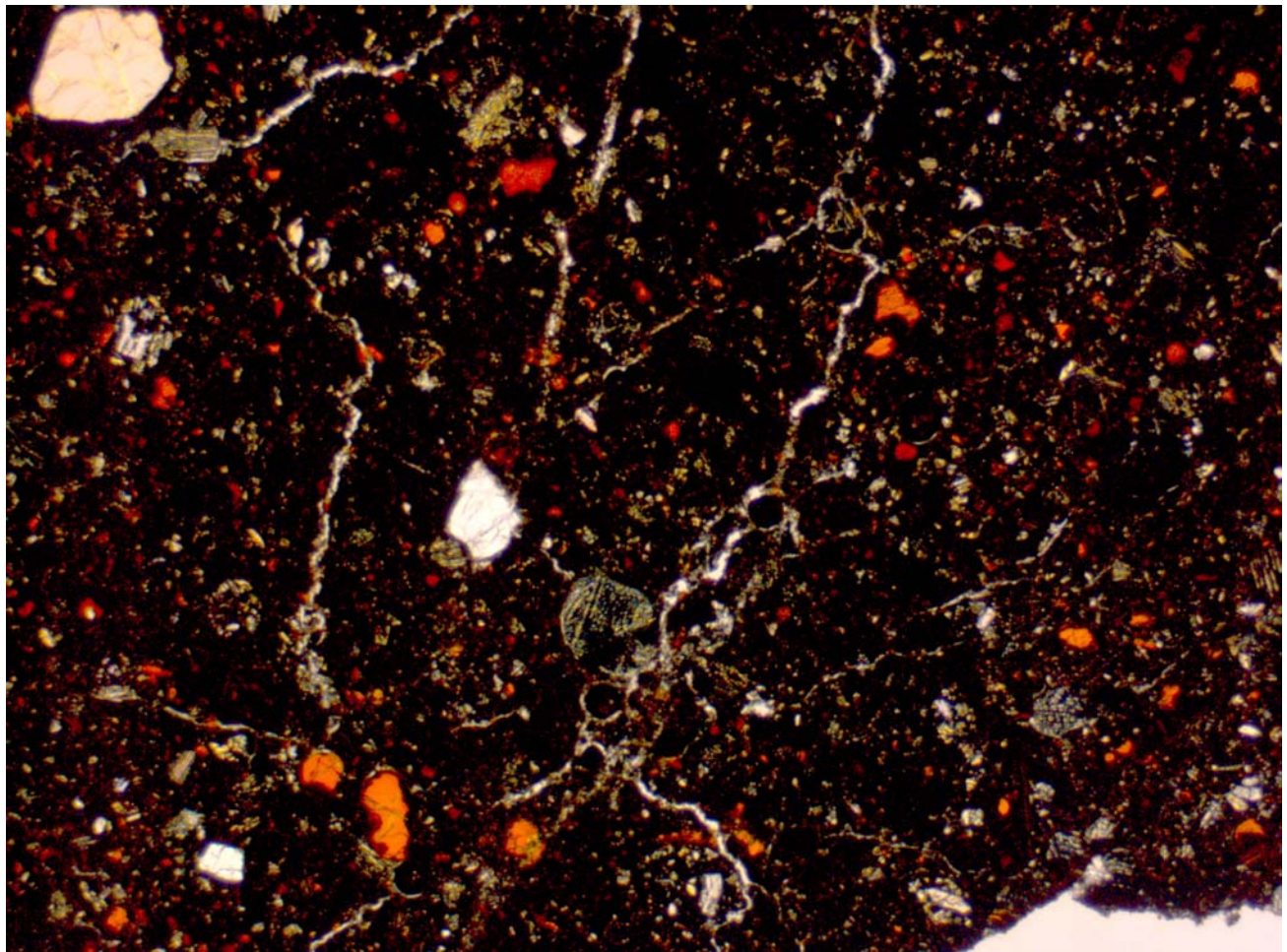
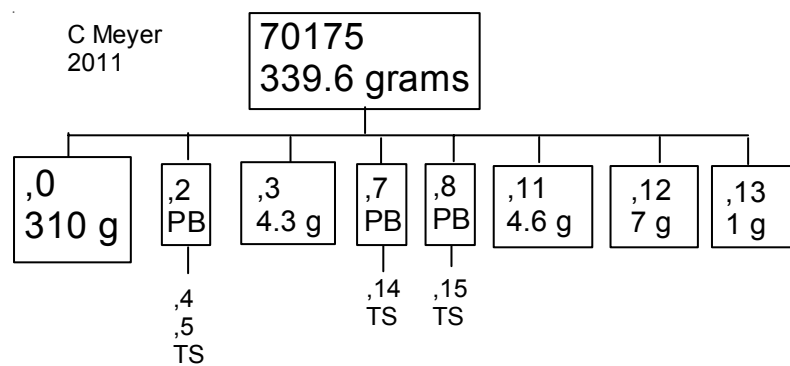


Figure 4: Thin section photomicrograph of 70175. Field of view is 2 mm.



Processing

70175 was returned in bag 55Y along with about 38 grams of residue that may be part of it. There are 4 thin sections.

Table 1. Chemical composition of 70175.

reference	Keith74		Simon90
<i>weight</i>			
SiO ₂ %			
TiO ₂		8.65	(b)
Al ₂ O ₃		5.83	(b)
FeO		22.9	(b)
MnO		0.275	(b)
MgO		13.9	(b)
CaO		7.2	(b)
Na ₂ O		0.39	(b)
K ₂ O	0.066	(a) 0.071	(b)
P ₂ O ₅			
<i>S %</i>			
<i>sum</i>			
Sc ppm		47	(b)
V		105	(b)
Cr		4850	(b)
Co		63.5	(b)
Ni		70	(b)
Cu			
Zn		190	(b)
Ga			
<i>Ge ppb</i>			
As			
Se			
Rb		3.3	(b)
Sr		200	(b)
Y			
Zr		120	(b)
Nb			
Mo			
Ru			
Rh			
<i>Pd ppb</i>			
<i>Ag ppb</i>			
<i>Cd ppb</i>			
<i>In ppb</i>			
<i>Sn ppb</i>			
<i>Sb ppb</i>			
<i>Te ppb</i>			
Cs ppm		0.22	(b)
Ba		80	(b)
La		5.9	(b)
Ce		17.5	(b)
Pr			
Nd		15.3	(b)
Sm		6.52	(b)
Eu		1.85	(b)
Gd		7.7	(b)
Tb		1.53	(b)
Dy		8.9	(b)
Ho			
Er			
Tm		0.61	(b)
Yb		3.77	(b)
Lu		0.5	(b)
Hf		5.4	(b)
Ta		1	(b)
<i>W ppb</i>			
<i>Re ppb</i>			
<i>Os ppb</i>			
<i>Ir ppb</i>			
<i>Pt ppb</i>			
<i>Au ppb</i>			
Th ppm	0.4	(a) 0.33	(b)
U ppm	0.105	(a) 0.08	(b)
<i>technique: (a) radiation count. , (b) INAA</i>			

References for 70175

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