

62275
Cataclastic Anorthosite
443 grams



Figure 1: Photo of 62275 before it broke-up. NASA S72-40930. Cube is 1 cm.

Introduction

62275 was found half buried in the regolith near Buster Crater and was thought to be related to ejecta from Buster Crater (Sutton 1981). It is a very friable, chalky white rock (figure 1) that broke up into powder (figure 8) during handling in curatorial labs and has not been adequately studied. It appears to be similar to 62236, 62237 and the white portion of 62255, but the plagioclase composition appears more calcic.

Petrography

Prinz et al. (1973) and Dowty et al. (1974) describe 62275 as a brecciated, shock-metamorphosed anorthosite and note that it has “*higher total mafic content than for other ferroan anorthosites*”.

Most of the large transparent fragments are not feldspar, but brownish glass of near-feldspar composition (Prinz et al. 1973). Only about a third of the feldspathic fragments are crystalline plagioclase – evidence of a high degree of shock metamorphism (figures 3 and 4).

Prinz et al. (1973) and Herzberg (1979) discuss the importance of the $FeCr_2O_4$ content of the chromite in this and other plutonic lunar rocks, attempting to obtain the depth of origin of these rocks.

Mineralogy

Olivine: Prinz et al. (1973) reported olivine as $Fo_{59.8}$.

Pyroxene: Prinz et al. (1973) found orthopyroxene was $Wo_{3.1}En_{67}$ and rare clinopyroxene was $Wo_{45.1}En_{38.1}$. Warner et al. (1976) give a plot of the pyroxene composition (figure 4).

Mineralogical Mode for 62275

	Prinz et al. 1973	Warren et al. 1983
Olivine	6	7 (mafic)
Pyroxene		
Ortho	1	
Clino	tr.	
Plagioclase	93 (inc. Glass)	93
Cr-Spinel	tr.	

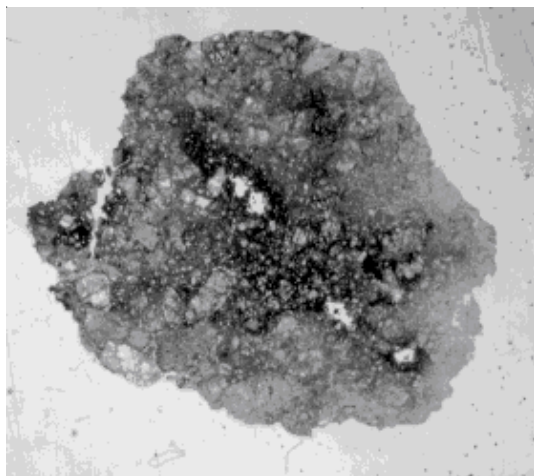
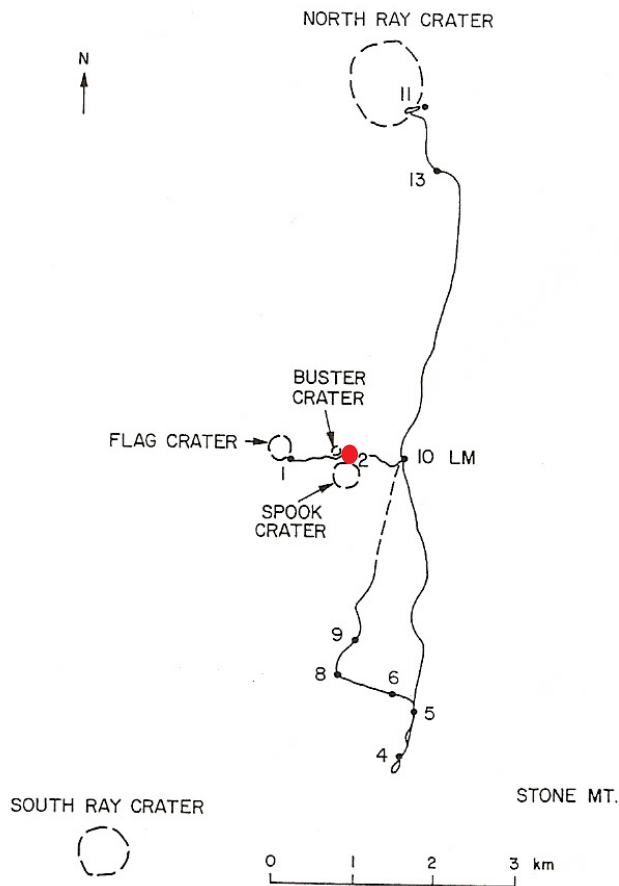


Figure 2: Photomicrograph of thin section 62275,4. Scale 1 cm.

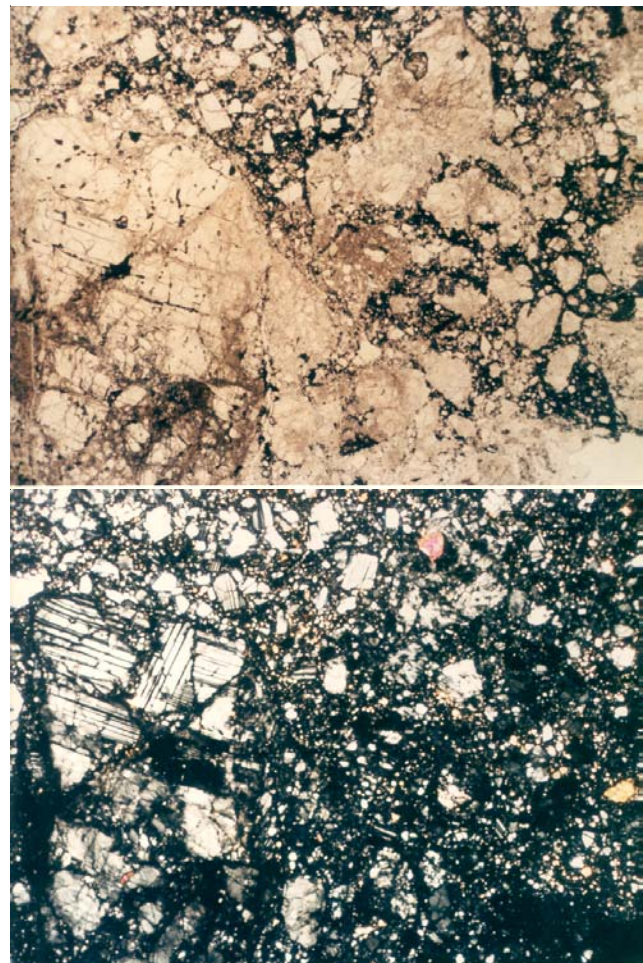


Figure 3: Photomicrographs of thin section of 62275. Field of view is 3 mm. NASA S72-42234 and S72-42233. Top is plane polarized light and bottom is same area with crossed polarizers showing high percentage of isotropic material.

Plagioclase: The plagioclase in 62275 is very calcic (An_{97-99}) and has low Mg content (Prinz et al. 1973). Warren et al. (1983) confirmed the very calcic nature of the plagioclase in this rock.

Cr-spinel: Prinz et al. (1973) report Al-rich, Cr-spinel and give an analysis.

Chemistry

Warren et al. (1983) appear to have analyzed nearly pure plagioclase (figure 7). They find the rock has very low meteoritic siderophile content.



Figure 4: Photo of thin section 62275,3. About 2 mm across. S72-45697.

Cosmogenic isotopes and exposure ages

Clark and Keith (1973) determined cosmic-ray induced activity as $^{26}\text{Al} = 94 \text{ dpm/kg.}$ and $^{22}\text{Na} = 28 \text{ dpm/kg.}$

Processing

Houston, you have a problem (figure 8)! There are only 3 thin sections of 62275.

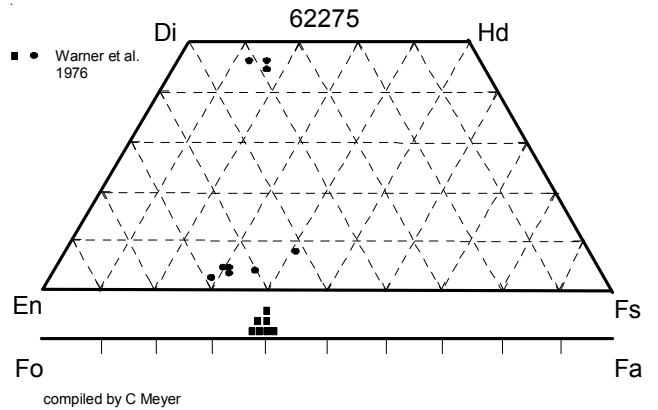


Figure 5: Olivine and pyroxene composition of 62275.

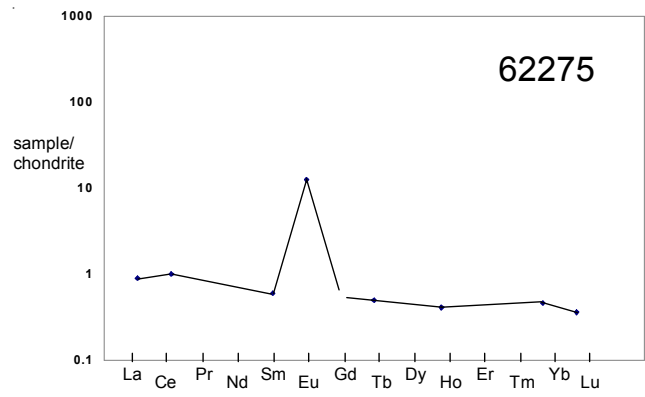
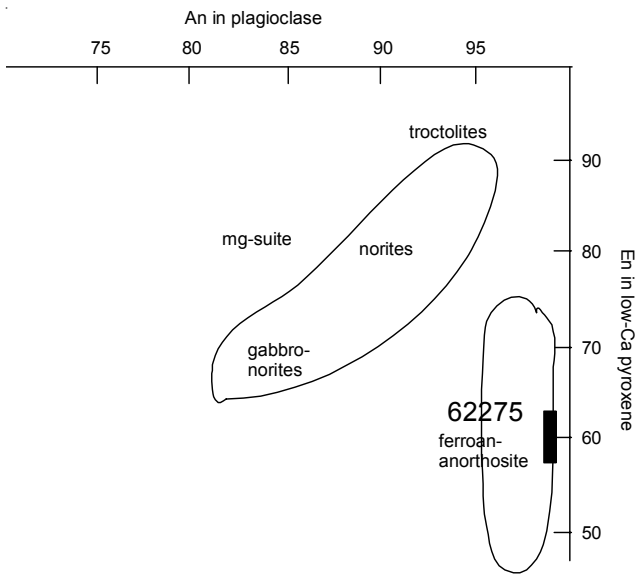


Figure 7: Normalized rare-earth-element diagram for 62275 plagioclase (by Warren et al. 1983).

Figure 6: Plagioclase and pyroxene composition of 62275.



Figure 8: Processing photo of 62275 showing how friable and powdery it is.

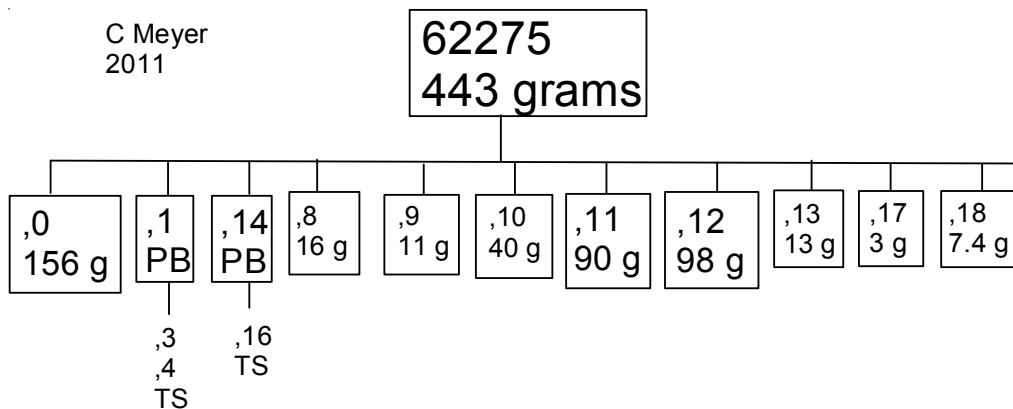


Table 1. Chemical composition of 62275.

reference weight	Prinz 73		matrix glass	plag?	
	Clark 73	Dowty 74	Prinz 73	Warren 83	Warner76
SiO ₂ %		43.7	(b) 44.3	(b) 43.86	(c)
TiO ₂		0.04	(b) 0.13	(b) 0.036	(c)
Al ₂ O ₃		33.1	(b) 30.2	(b) 35.3	(c)
FeO		2.2	(b) 3.4	(b) 0.54	(c)
MnO			0.04	0.01	(c)
MgO		1.91	(b) 3.1	(b) 0.4	(c)
CaO		18.4	(b) 18.6	(b) 19.45	(c)
Na ₂ O		0.3	(b) 0.34	(b) 0.32	(c)
K ₂ O	0.0178	(a) 0.06	(b) 0.03	(b) 0.021	(c)
P ₂ O ₅					
S %					
sum					
Sc ppm				1.7	(c)
V					
Cr		1984	(b) 410	(b) 96	(c)
Co				0.58	(c)
Ni				0.13	(c)
Cu					
Zn				1.11	(c)
Ga				3.4	(c)
Ge ppb				4.6	(c)
As					
Se					
Rb				2	(c)
Sr				147	(c)
Y					
Zr				90	(c)
Nb					
Mo					
Ru					
Rh					
Pd ppb					
Ag ppb					
Cd ppb				1.1	(c)
In ppb					
Sn ppb					
Sb ppb					
Te ppb					
Cs ppm					
Ba				11	(c)
La				0.21	(c)
Ce				0.61	(c)
Pr					
Nd					
Sm				0.088	(c)
Eu				0.7	(c)
Gd					
Tb				0.018	(c)
Dy					
Ho				0.023	(c)
Er					
Tm					
Yb				0.074	(c)
Lu				0.0088	(c)
Hf				0.036	(c)
Ta				0.026	(c)
W ppb					
Re ppb				<0.001	(c)
Os ppb					
Ir ppb				0.023	(c)
Pt ppb					
Au ppb				0.009	(c)
Th ppm	0.009	(a)		<0.036	(c)
U ppm	<0.006	(a)			

technique: (a) radiation counting, (b) elec. Probe, (c) INAA, RNAA

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