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.

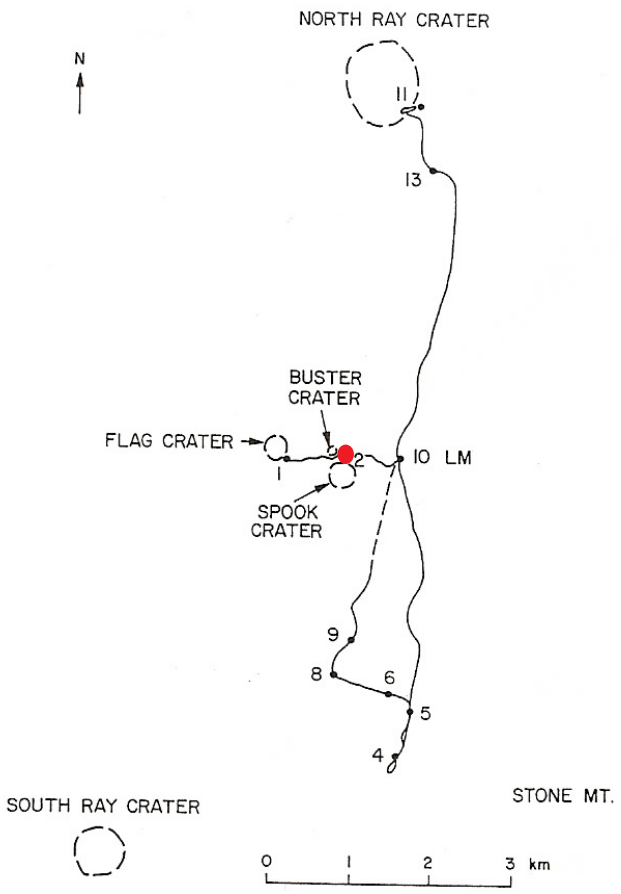
Mineralogy

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.	



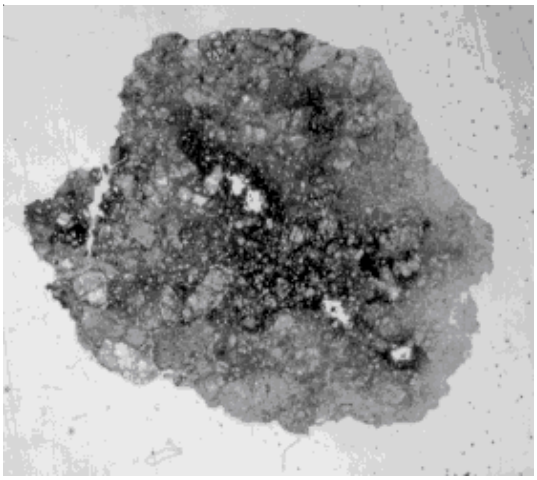


Figure 2: Photomicrograph of thin section 62275,4. Scale 1 cm.

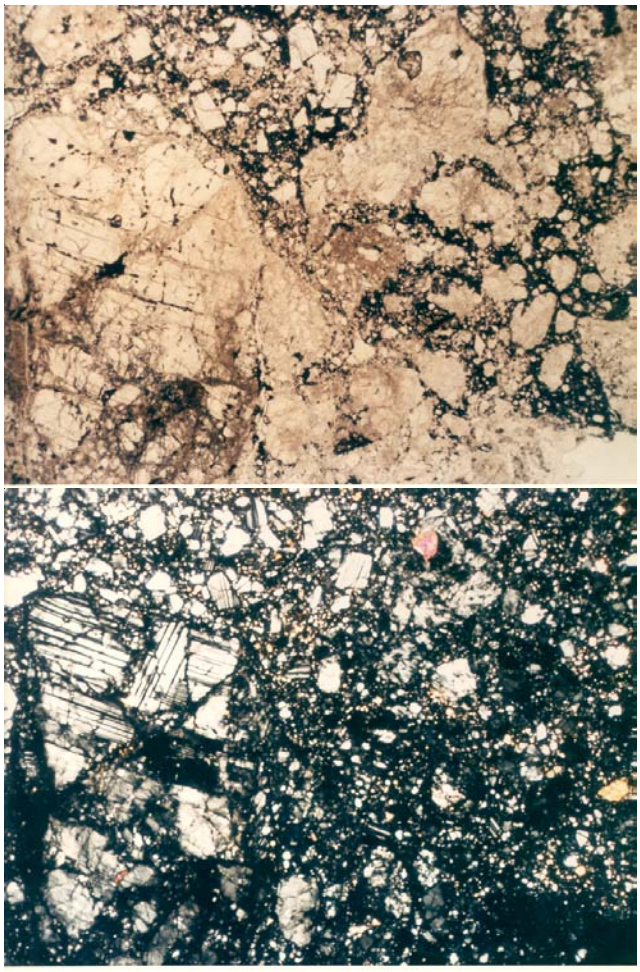


Figure 3: Photomicrographs of thin section of 62275. Field of view is 3 mm. NASA S72-42234 and S72-42233. Top is plane polarized light and bottom is same area with crossed polarizers showing high percentage of isotropic material.

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}Al = 94 dpm/kg. and ^{22}Na = 28 dpm/kg.

Processing

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

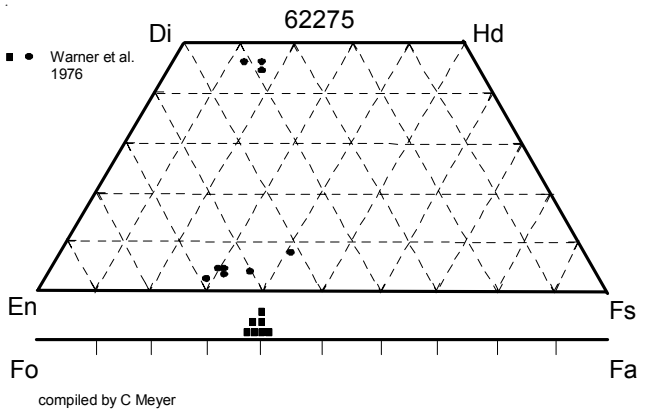


Figure 5: Olivine and pyroxene composition of 62275.

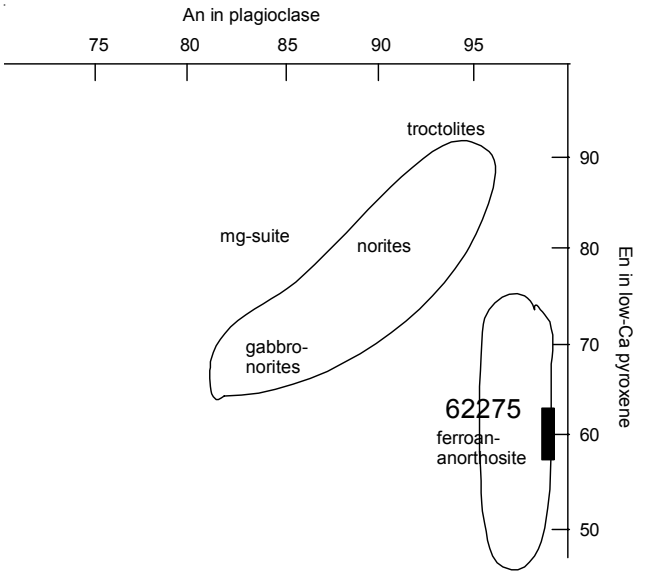


Figure 6: Plagioclase and pyroxene composition of 62275.

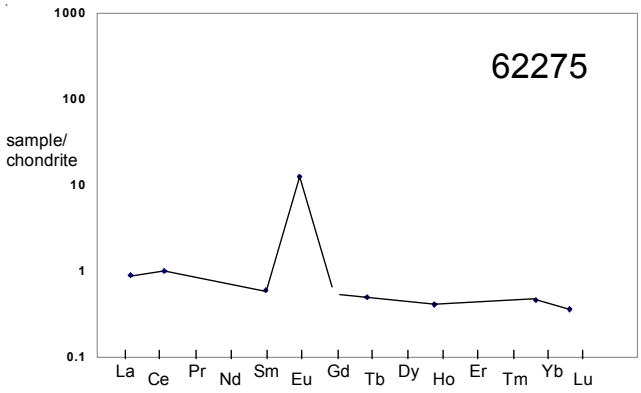


Figure 7: Normalized rare-earth-element diagram for 62275 plagioclase (by Warren et al. 1983).

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

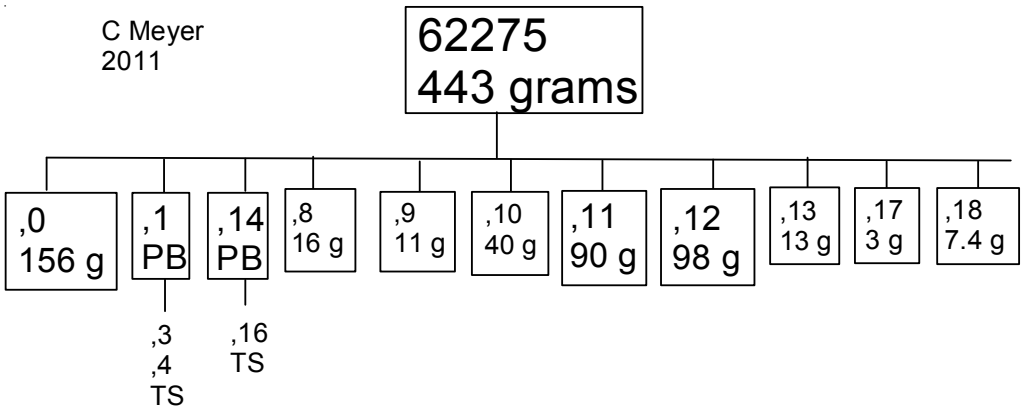


Table 1. Chemical composition of 62275.

			Prinz 73		matrix glass		plag?	
reference	Clark 73		Dowty 74		Prinz 73		Warren 83	
weight			Warner76					
SiO2 %			43.7	(b)	44.3	(b)	43.86	(c)
TiO2			0.04	(b)	0.13	(b)	0.036	(c)
Al2O3			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)
Na2O			0.3	(b)	0.34	(b)	0.32	(c)
K2O	0.0178	(a)	0.06	(b)	0.03	(b)	0.021	(c)
P2O5								
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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