

64425

Dilithologic breccia

14.62 grams



Figure 1: Surface T, of 64425. Sample is 4 cm long. NASA S88-46191.

Introduction

Sample 64425 was sieved from soil 64420 which was collected from the bottom of a 25 cm deep trench at the bottom of a small double crater on the rim of a 15 meter crater (Cinco 'a') on Stone Mountain. It is part anorthosite and part impact melt (figure 1). Most surfaces have micrometeorite craters, indicating it had once been a surface sample.

It is thought that dimict breccias similar in appearance to 64425 (e.g. 64435, 64475) may be ejecta from South Ray Crater (James and Lindstrom 1991).

Petrography

Walnut sample 64425 was described and analyzed by James and Lindstrom (1991). They noted it was made up of two prominent lithologies: a) granulated ferroan anorthosite (white) and b) fragment-laden impact-melt

(dark). The dark melt rock invades the white anorthosite and forms a network of thin veinlets that envelop the anorthosite fragments. The anorthosite is cataclastic with grain size from 10 microns up to 1 mm. There is only minor mafic minerals content (orthopyroxene and augite).

The melt rock varies from subvitreous to very fine grained intersertal. It has from zero to 50 % clastic material, mostly plagioclase, with minor globules of iron intergrown with troilite and or schreibersite.

Chemistry

There is a wide range of chemical composition between the two major lithologies in 64425 (table 1 and figure 3).



Figure 2: Surface B, of 64425. Sample is 4 cm long. NASA S88-46192.

References 64425

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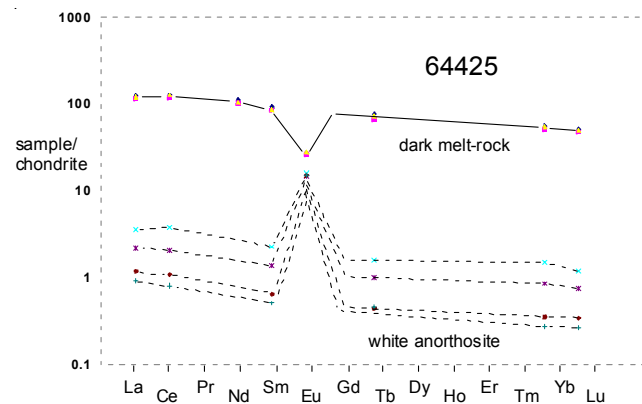


Figure 3: Chemical composition of light and dark lithology of 64425.

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Table 1. Chemical composition of 64425.

reference weight	James and Lindstrom 91 melt rock			,11 ,8 ,12 ,13 anorthosite				
SiO2 %								
TiO2								
Al2O3								
FeO	7.67	6.99	7.74	0.445	0.477	0.342	0.409	(a)
MnO								
MgO								
CaO	11.3	12.7	13.1	19.3	18.3	18.6	19	(a)
Na2O	0.527	0.505	0.538	0.418	0.38	0.392	0.381	(a)
K2O	0.21	0.18	0.17		0.032	0.03	0.044	(a)
P2O5								
S %								
sum								
Sc ppm	11.42	10.67	11.07	0.98	0.92	0.6	0.725	(a)
V								
Cr	1148	1052	1117	69	69	38	47	(a)
Co	50	45	59	0.7	0.55	0.39	0.45	(a)
Ni	810	740	920					(a)
Cu								
Zn								
Ga								
Ge ppb								
As								
Se								
Rb								
Sr	160	180	180	189	172	175	174	(a)
Y								
Zr	440	390	370	24	10			(a)
Nb								
Mo								
Ru								
Rh								
Pd ppb								
Ag ppb								
Cd ppb								
In ppb								
Sn ppb								
Sb ppb								
Te ppb								
Cs ppm	0.17	0.22	0.2	0.05	0.05	0.04	0.06	(a)
Ba	278	252	263	20	11	9.3	11	(a)
La	29.3	26.9	27.9	0.85	0.511	0.282	0.218	(a)
Ce	76.1	71.2	76.1	2.29	1.25	0.65	0.49	(a)
Pr								
Nd	50	46	47					(a)
Sm	13.5	12.41	12.7	0.342	0.208	0.097	0.076	(a)
Eu	1.53	1.47	1.56	0.891	0.825	0.846	0.853	(a)
Gd								
Tb	2.78	2.44	2.62	0.059	0.037	0.0162	0.017	(a)
Dy								
Ho								
Er								
Tm								
Yb	9.11	8.33	8.83	0.25	0.14	0.058	0.046	(a)
Lu	1.25	1.15	1.2	0.03	0.0184	0.0086	0.007	(a)
Hf	10.1	9.1	9.61	0.21	0.134	0.051	0.03	(a)
Ta	1.05	0.99	1.05	0.027	0.017	0.006		(a)
W ppb								
Re ppb								
Os ppb								
Ir ppb	21	12.6	21.3					(a)
Pt ppb								
Au ppb	18.2	16	21.5					(a)
Th ppm	4.34	4.36	4.31	0.13	0.059	0.019	0.011	(a)
U ppm	1.29	1.19	1.09					(a)

technique: (a) INAA