65075

Impact Melt

108 grams

Figure 1: Photo of 65075,1. Cube is 1 cm. S72-39406

Introduction

Station 5 was at the transition between Stone Mountain and the Cayley Plains. 65075 was collected from the inner wall of a 20 m subdued crater relatively close to rake samples 65500 and 65900 – see sections on 65501 and 65901. It is a greenish gray breccias with a black glass coating. It is highly fractured and broke in pieces during return (figures 1 and 3).

Petrography

Grieve and Plant (1973) studied 65075 is some detail and this has been critically summarized by Ryder and Norman (1980). It seems clear that the crystalline interior is an impact melt rock with highland composition (~ 30 % Al_2O_3). It has relict ophitic, subophitic and poikiolitic textures, but it has been highly shocked so that the clast matrix relationship is confused (figures 2 and 3). There is a great deal of glass. No pyroxene diagram has been published.

Hunter and Taylor (1981) reported lots of rust.

Mineralogical Mode

None reported

Figure 2: Thin section photomicrograph of 65075, 9 (from Grieve and Plant 1973).

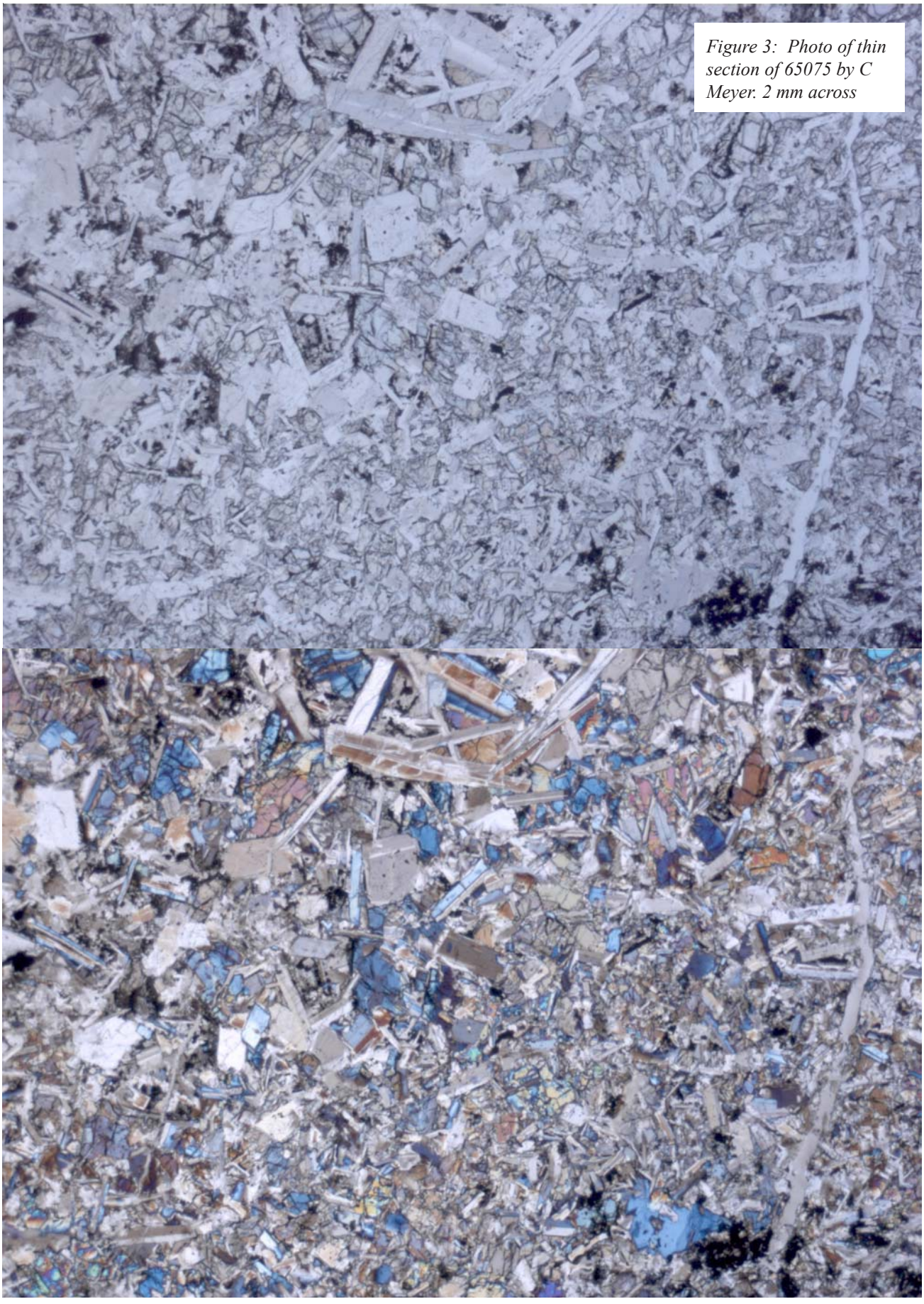


Figure 3: Photo of thin section of 65075 by C Meyer. 2 mm across

Table 1. Chemical composition of 65075

	glass				glass av.	anor. av.		anor	
reference	Morris 86		Rancitelli73		Grieve73			See86	
weight	See 86		bulk						
SiO2 %	45.05	(c)			44.45	43.98	(d)	43.7	(c)
TiO2	0.23	(a)			0.33	0.23	(d)	0.05	(c)
Al2O3	30	(c)			24.75	30.92	(d)	30.3	(c)
FeO	3.3	(a)			6.62	1.94	(d)	3.24	(c)
MnO		(a)			0.06	0.04	(d)	0.06	(c)
MgO	4.26	(c)			8.26	3.08	(d)	4.8	(c)
CaO	16.8	(a)			14.4	17.25	(d)	16.7	(c)
Na2O	0.49	(a)			0.76	0.83	(d)	0.38	(c)
K2O	0.06	(a)	0.193	(b)	0.08	0.12	(d)	0.02	(c)
P2O5									
S %									
sum									
Sc ppm	6.47	(a)							
V									
Cr	901	(a)							
Co	72	(a)							
Ni	1278	(a)							
Cu									
Zn									
Ga									
Ge ppb									
As									
Se									
Rb									
Sr									
Y									
Zr									
Nb									
Mo									
Ru									
Rh									
Pd ppb									
Ag ppb									
Cd ppb									
In ppb									
Sn ppb									
Sb ppb									
Te ppb									
Cs ppm									
Ba	197	(a)							
La	11.7	(a)							
Ce	28.3	(a)							
Pr									
Nd									
Sm	4.95	(a)							
Eu	1.05	(a)							
Gd									
Tb	1.03	(a)							
Dy									
Ho									
Er									
Tm									
Yb	3.45	(a)							
Lu	0.49	(a)							
Hf	3.56	(a)							
Ta	0.36	(a)							
W ppb									
Re ppb									
Os ppb									
Ir ppb									
Pt ppb									
Au ppb									
Th ppm	2.5	(a)	2.89	(b)					
U ppm	0.69	(a)	0.84	(b)					

technique: (a) INAA, (b) radiation count., (c) broad beam e probe, (d) averages of probe data

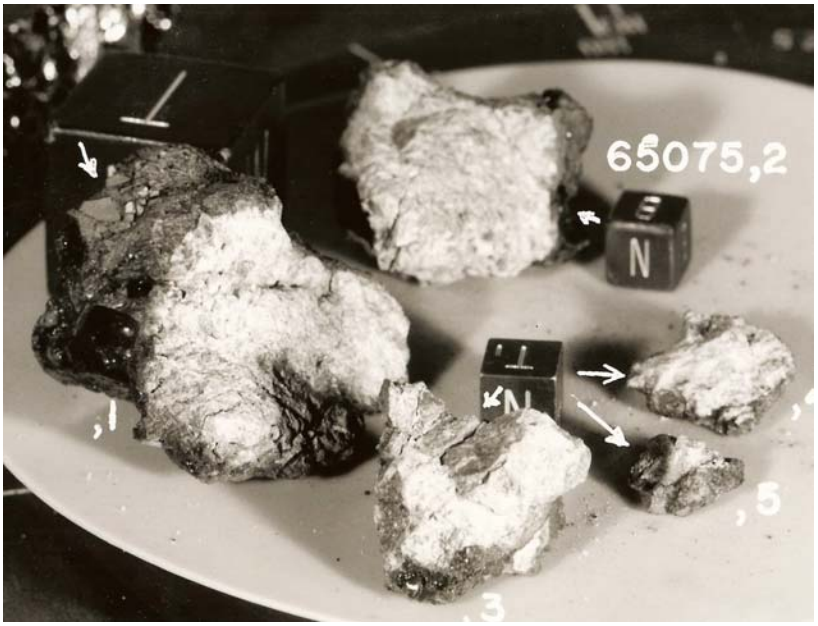
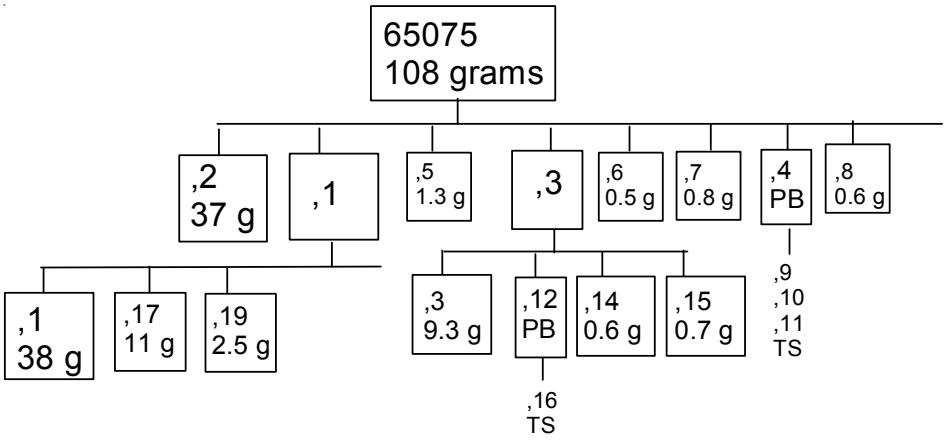


Figure 4: Processing photo of 65075. Cube is 1 cm. S72-44647



Mineralogy

Olivine: Fo_{75}

Plagioclase: An_{95}

Spinel: Pleonaste spinel has been reported

Chemistry

Rancitelli et al. (1973) provide a bulk analysis – but for only K, U, and Th. Grieve and Plant (1973) provide reliable major element analyses, but no trace element analyses. Morris et al. (1986) analyzed the glass coating for trace elements, but the glass may not be representative of the rock. So if someone wants to analyze something, please request a representative piece of the interior of this sample.

Cosmogenic isotopes and exposure ages

Rancitelli et al. (1973) determined the cosmic-ray-induced activity of ^{22}Na = 50 dpm/kg and ^{26}Al = 136 dpm/kg.

Processing

There are 4 thin sections of 65075. More are needed from a piece from the interior.

References for 65075

Butler P. (1972a) Lunar Sample Information Catalog Apollo 16. Lunar Receiving Laboratory. MSC 03210 Curator's Catalog. pp. 370.

Grieve R.A.F. and Plant A.G. (1973) Partial melting on the lunar surface, as observed in glass coated Apollo 16 samples. *Proc. 4th Lunar Sci. Conf.* 667-679.

Hunter R.H. and Taylor L.A. (1981) Rust and schreibersite in Apollo 16 highland rocks: Manifestations of volatile-element mobility. *Proc. 12th Lunar Planet. Sci. Conf.* 253-259.

LSPET (1973b) The Apollo 16 lunar samples: Petrographic and chemical description. *Science* **179**, 23-34.

LSPET (1972c) Preliminary examination of lunar samples. *In* Apollo 16 Preliminary Science Report. NASA SP-315, 7-1—7-58.

Morris R.V., See T.H. and Horz F. (1986) Composition of the Cayley Formation at Apollo 16 as inferred from impact melt splashes. *Proc. 17th Lunar Planet. Sci. Conf.* in J. Geophys. Res. **90**, E21-E42.

Rancitelli L.A., Perkins R.W., Felix W.D. and Wogman N.A. (1973a) Preliminary analysis of cosmogenic and primordial radionuclides in Apollo 17 samples (abs). *Lunar Sci.* **IV**, 612-614. Lunar Planetary Institute, Houston.

Rancitelli L.A., Perkins R.W., Felix W.D. and Wogman N.A. (1973b) Primordial radiouclides in soils and rocks from the Apollo 16 site(abs). *Lunar Sci.* **IV**, 615-617. Lunar Planetary Institute, Houston.

Ryder G. and Norman M.D. (1980) Catalog of Apollo 16 rocks (3 vol.). Curator's Office pub. #52, JSC #16904

See T.H., Horz F. and Morris R.V. (1986) Apollo 16 impact-melt splashes: Petrography and major-element composition. *Proc. 17th Lunar Planet. Sci. Conf.* in J. Geophys. Res. **91**, E3-E20.

Sutton R.L. (1981) Documentation of Apollo 16 samples. In Geology of the Apollo 16 area, central lunar highlands. (Ulrich et al.) U.S.G.S. Prof. Paper 1048.

Warner J.L., Simonds C.H. and Phinney W.C. (1973b) Apollo 16 rocks: Classification and petrogenetic model. *Proc. 4th Lunar Sci. Conf.* 481-504.