

**67715** – 9.4 grams  
**67716** – 17 grams  
 Impact Melt Breccia

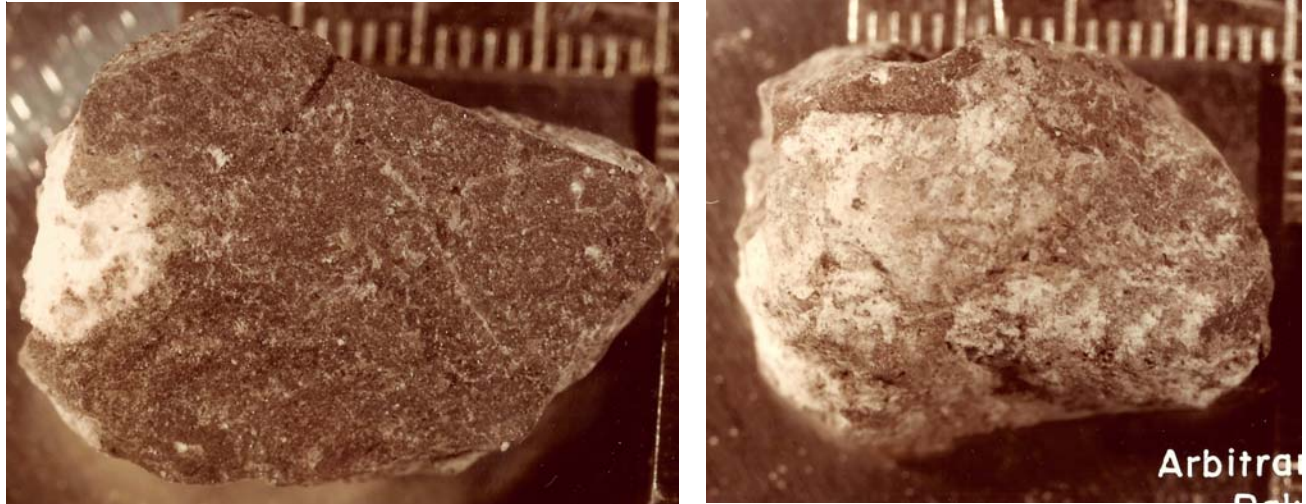


Figure 1 and 2: Photos of 67715. Scale is marked inmm. S80-35167

**Introduction**

Thirty-two rake samples were collected near House Rock on the rim of North Ray Crater – see section on 67701.

**Petrography**

67715 and 67716 are two coherent, fine-grained impact melt rocks, but there is not enough data to tell if they are alike. Both rocklets have abundant clasts of plagioclase set in an aphanitic matrix (figures 3, 4, 5 and 6). According to Reimold et al. (1985), 67715 has olivine as the major mafic mineral and may have a high proportion of opaques.

67716 is reported to have pink spinel as a large clast and is probably more aluminous.

Mineral analysis are not to be found in the literature.

**Chemistry**

67715 has been well analyzed for Rb, Sr, Sm and Nd. Stoffler et al. (1985) analyzed 67715.

**Radiogenic age dating**

Reimold et al. (1985) collected whole rock isotope data for both Rb-Sr and Sm-Nd.

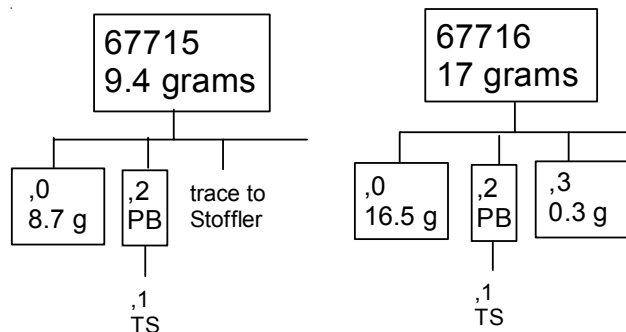
**Processing**

There is one thin section of each rock.

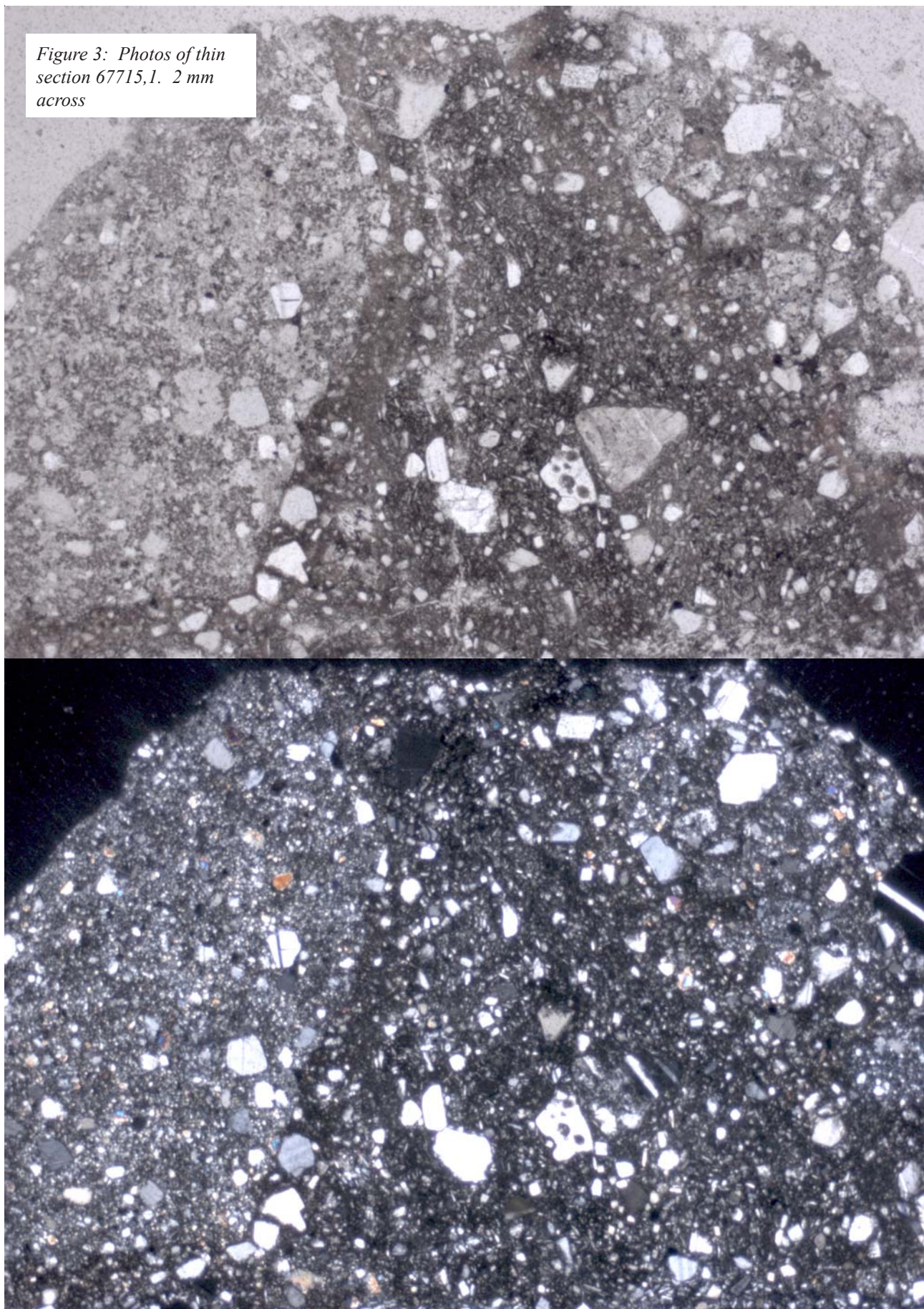
**Mineralogical Mode 67715**

*Reimold et al. 1985*

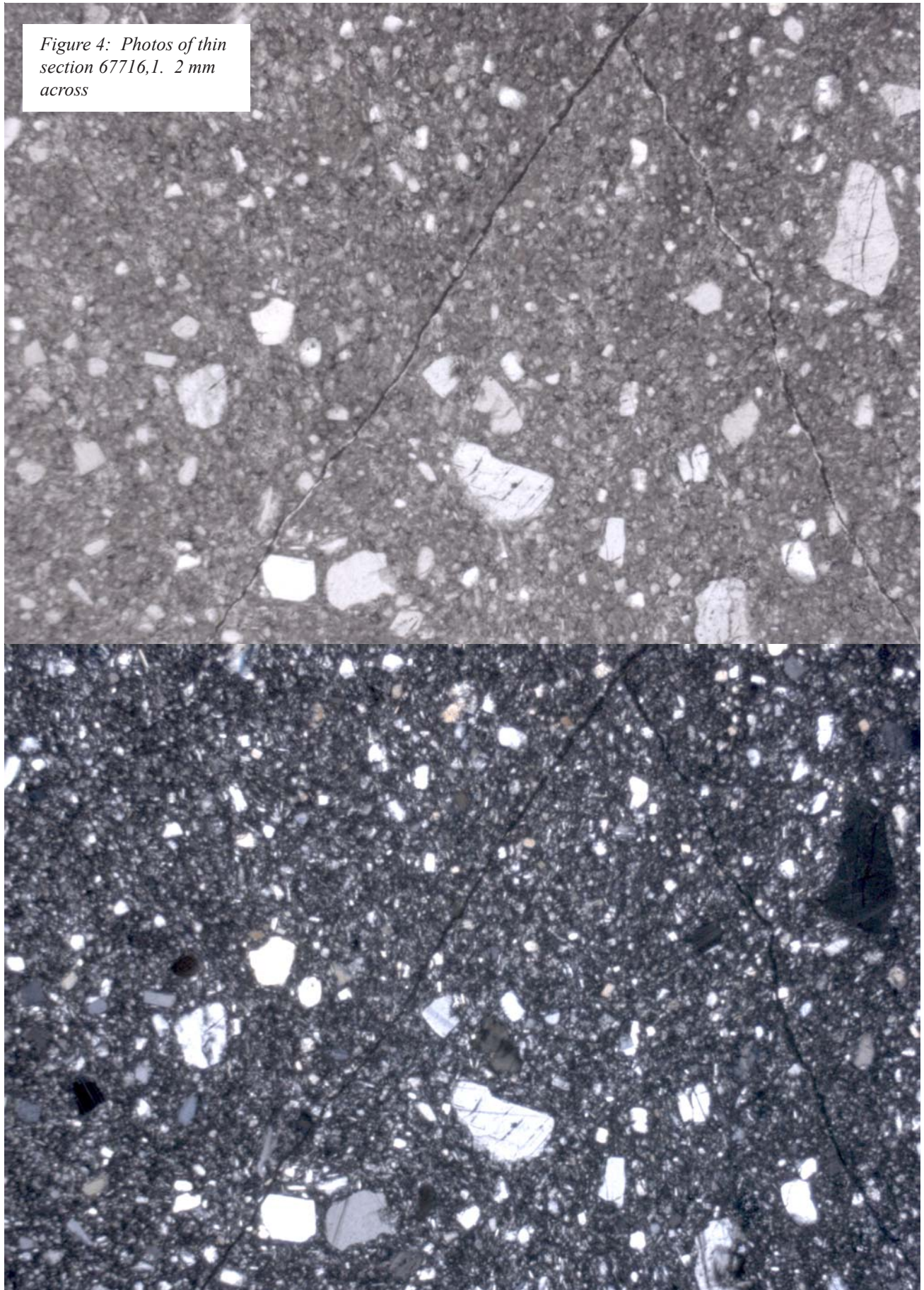
Plagioclase	76.5 %
Pyroxene	
Olivine	15.6
Opaque	6.5
Metal	1.2



*Figure 3: Photos of thin section 67715, l. 2 mm across*



*Figure 4: Photos of thin section 67716,1. 2 mm across*



**Table 1. Chemical composition of 67715**

reference weight	Borchardt Stoffle85	Reimold75	
SiO2 %	45.5	(a)	
TiO2	0.37	(a)	
Al2O3	30.2	(a)	
FeO	3.2	(a)	
MnO	0.01	(a)	
MgO	2.88	(a)	
CaO	17	(a)	
Na2O	0.74	(a)	
K2O	0.07	(a)	
P2O5	0.01	(a)	
S %			
sum			
Sc ppm	3.77	(b)	
V			
Cr			
Co	7.9	(b)	
Ni	131	(b)	
Cu			
Zn			
Ga			
Ge ppb			
As			
Se			
Rb		0.44	(c)
Sr		210	(c)
Y			
Zr			
Nb			
Mo			
Ru			
Rh			
Pd ppb			
Ag ppb			
Cd ppb			
In ppb			
Sn ppb			
Sb ppb			
Te ppb			
Cs ppm			
Ba	50	(b)	
La			
Ce			
Pr			
Nd			3.03 (c)
Sm	0.99	(b)	0.86 (c)
Eu			
Gd			
Tb			
Dy			
Ho			
Er			
Tm			
Yb	0.78	(b)	
Lu			
Hf			
Ta			
W ppb			
Re ppb			
Os ppb			
Ir ppb			
Pt ppb			
Au ppb			
Th ppm			
U ppm			
technique:	(a) DBA, (b) INAA, (c) IDMS		

**References for 67715 and 67716**

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

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.

Reimold W.U. and Borchardt R. (1984) Subophitic lithologies in KREEP-rich poikilitic impact melt rocks from Cayley Plains, Apollo 16 – remnants of a volcanic Highland curst? *Earth Planet. Sci. Lett.* **67**, 9-18.

Reimold W.U. and Reimold J.N. (1984) The mineralogical, chemical and chronological characteristics of the crystalline Apollo 16 impact melt rocks. *Forschr. Mineral.* **62**, 269-301.

Reimold W.U., Nyquist L.E., Bansal B.M., Wooden J.L., Shih C.-Y., Wiesmann H. and Mackinnon I.D.R. (1985) Isotope analysis of crystalline impact-melt rocks from Apollo 16 stations 11 and 13. North Ray Crater. *Proc. 15<sup>th</sup> Lunar Planet. Sci. Conf.* in *J. Geophys. Res.* **90**, C431-C448.

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

Stöffler D., Ostertag R., Reimold W.U., Borchardt R., Malley J. and Rehfeldt A. (1981) Distribution and provenance of lunar highland rock types at North Ray Crater, Apollo 16. *Proc. 12<sup>th</sup> Lunar Planet. Sci. Conf.* 185-207.

Stöffler D., Bischoff A., Borchardt R., Burgehele A., Deutsch A., Jessberger E.K., Ostertag R., Palme H., Spettel B., Reimold W.U., Wacker K. and Wanke H. (1985) Composition and evolution of the lunar crust in the Descartes highlands. *Proc. 15<sup>th</sup> Lunar Planet. Sci. Conf.* in *J. Geophys. Res.* **90**, C449-C506.

Smith J.V. and Steele I.M. (1972c) Apollo 16 rake samples 67515 to 68537: Sample classification, description and inventory. Curator Catalog, JSC

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.