

**64538**  
Poly lithologic Breccia  
30 grams



*Figure 1: Photo of 64538 with 1 cm orientation cube. S72-43419.*

### **Introduction**

64538 is a rake sample from station 4, Apollo 16 – see section on 64501. It is slightly different from 64546 etc., because it has three lithologies (figure 1) and the only analysis seems to be much more aluminous. The are micrometeorite craters on all surfaces.

### **Petrography**

Ryder and Norman (1980) provide the only description. There are three lithologies separated by sharp boundaries. Two lithologies seem to be those of the dimict breccia so common at this site. But the majority of the sample is a coherent, medium grey, glassy matrix lithology. Mineral chemistry is not reported.

### **Chemistry**

McKinley et al. (1983) reported the only analysis, which may be unrepresentative. The Ti content is very low and Al is very high.

### **Processing**

There are two thin sections of 64538.

### **References for 64538**

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

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

### **Table 1. Chemical composition of 64538.**

<i>reference weight</i>	McKinley83	
SiO <sub>2</sub> %	45.3	(a)
TiO <sub>2</sub>	0.01	(a)
Al <sub>2</sub> O <sub>3</sub>	33.3	(a)
FeO	1.26	(a)
MnO	0.01	(a)
MgO	1.16	(a)
CaO	18.2	(a)
Na <sub>2</sub> O	0.07	(a)
K <sub>2</sub> O	0.04	(a)
P <sub>2</sub> O <sub>5</sub>		
S %		
<i>sum</i>		(a)

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

McKinley J.P., Taylor G.J., Keil K., Ma M.-S. and Schmitt R.A. (1984) Apollo 16: Impact sheets, contrasting nature of the Cayley Plains and Descartes Mountains, and geologic history. *Proc. 14<sup>th</sup> Lunar Planet. Sci. Conf.* in *J. Geophys. Res.* **89**, B513-B524.

Phinney W. and Lofgren G. (1973) Description, classification and inventory of Apollo 16 rake samples from stations 1, 4 and 13. Curators Office.

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

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.