

64568

Poikilitic Impact Melt Breccia

9.38 grams



Figure 1: Photo of 64568 showing numerous zap pits. Sample is about 3 cm across. S72-55370.

Introduction

64568 is a rake sample from the bottom slope of Stone Mountain - see section on 64501. It has a poikilitic texture with a network of pyroxene phenocrysts surrounding small laths of plagioclase (figures 2 and 3). It was from the surface of the regolith, as illustrated by the zap pits (figure 1). It has been dated at ~ 3.87 b.y.

Petrography

Simonds et al. (1973) classified 64568 as a poikilitic rock and gave pyroxene data (figure 4). This sample should be compared with 64567, 64569 and 62235.

Composition

McKinley et al. (1984) give the chemical composition of 64568. The sample seems to have high K. Trace elements have not been reported.

Crystallization Age

Norman et al. (2006) determined the age of 64568 by Ar/Ar to be 3.867 ± 0.09 b.y. (figure 5).

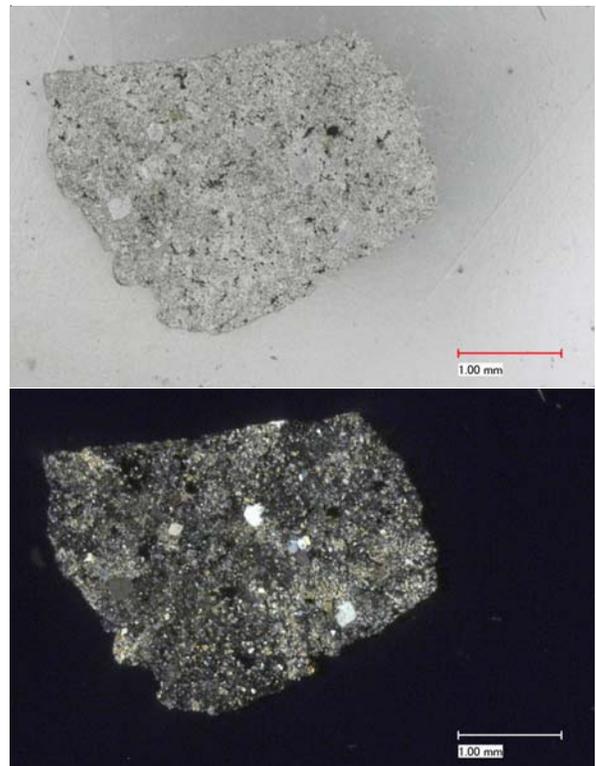


Figure 2: Photomicrographs of thin section 64568,4 by C Meyer @ 50x.

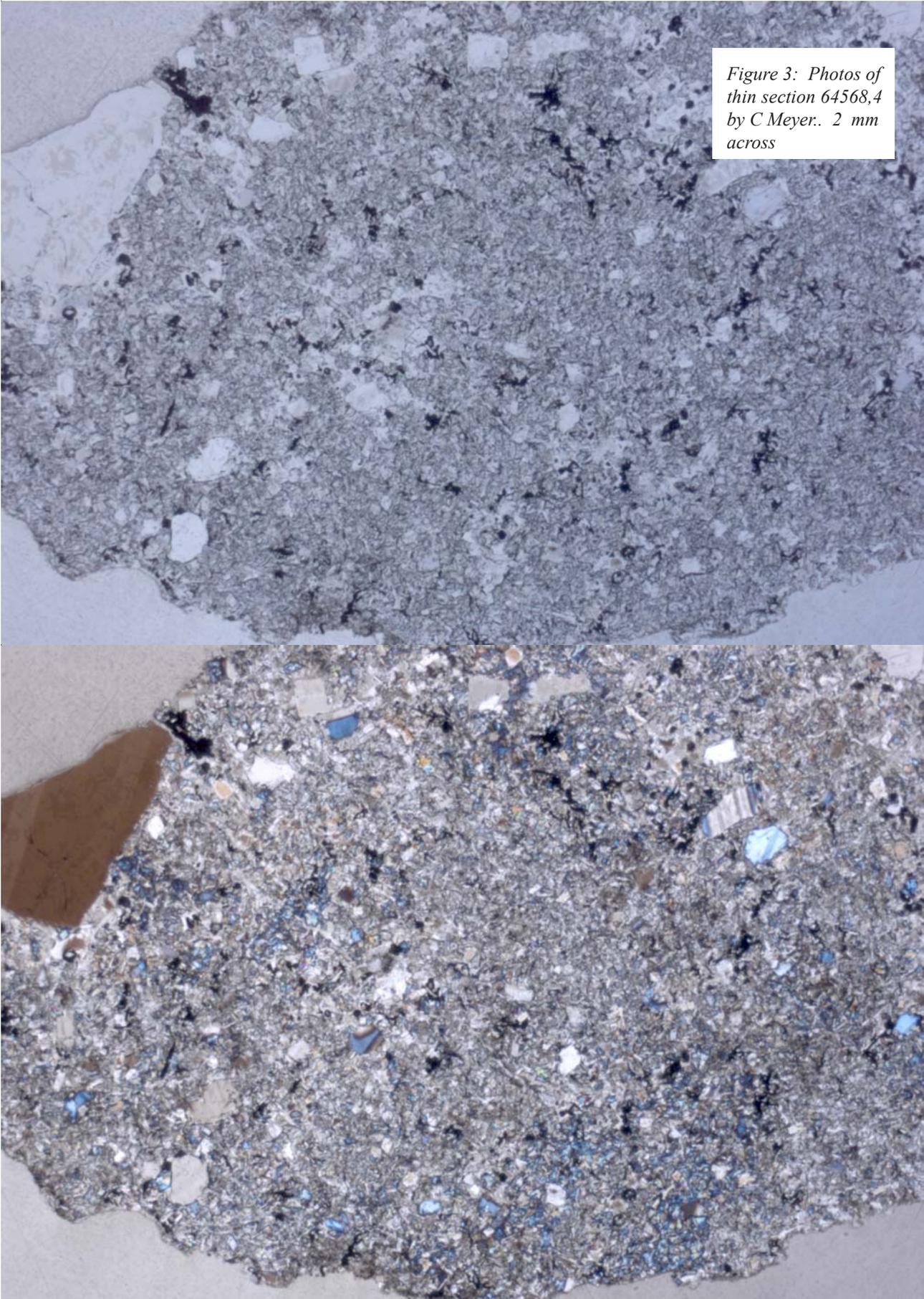


Figure 3: Photos of thin section 64568,4 by C Meyer.. 2 mm across

Table 1. Chemical composition of 64568.

| reference | McKinley83 | |
|--------------------------------|------------|-----|
| weight | | |
| SiO ₂ % | 47.84 | (a) |
| TiO ₂ | 0.63 | (a) |
| Al ₂ O ₃ | 22.88 | (a) |
| FeO | 4.99 | (a) |
| MnO | 0.09 | (a) |
| MgO | 9.15 | (a) |
| CaO | 13.2 | (a) |
| Na ₂ O | 0.49 | (a) |
| K ₂ O | 0.35 | (a) |
| P ₂ O ₅ | | |
| S % | | |
| sum | | |
| <i>(a) broad beam e probe</i> | | |

Other properties

Pearce and Simonds (1974) determined the ratio of Fe metal to Fe silicate by magnetic measurements.

Processing

There is only one small thin section of 74568.

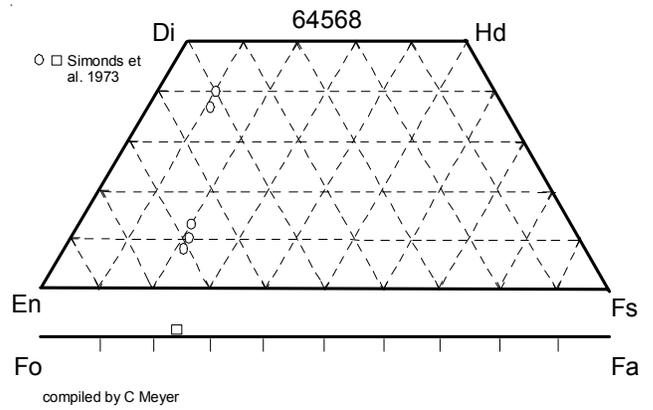


Figure 4: Olivine and pyroxene composition for 64568 (Simonds et al. 1974).

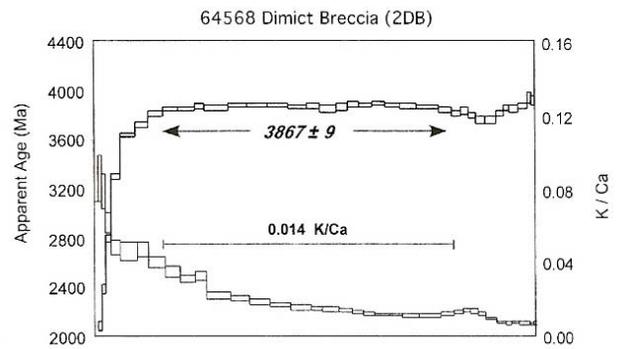
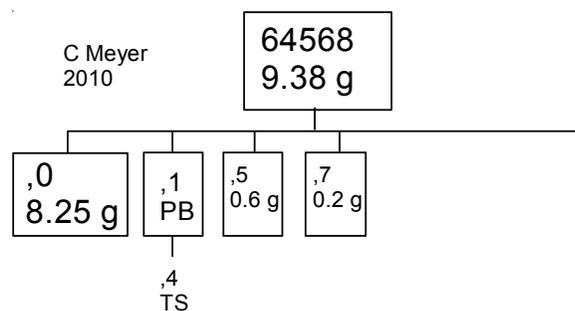


Figure 5: Ar/Ar plateau age for 64568 (Norman et al. 2006).



C Meyer
2010

References for 64568

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

Korotev R.L. (1996c) On the relationship between the Apollo 16 ancient regolith breccias and feldspathic fragmental breccias, and the composition of the prebasin crust in the Central Highlands of the Moon. *Meteor. & Planet. Sci.* **31**, 403-412.

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

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

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. 14th Lunar Planet. Sci. Conf.* in *J. Geophys. Res.* **89**, B513-B524.

Norman M.D., Duncan R.A. and Huard J.J. (2006) Identifying impact events within the lunar catalysm from ⁴⁰Ar-³⁹Ar ages and compositions of Apollo 16 impact melt rocks. *Geochim. Cosmochim. Acta* **70**, 6032-6049.

Pearce G.W. and Simonds C.H. (1974) Magnetic properties of Apollo 16 samples and implications for their mode of formation. *J. Geophys. Res.* **79**, 2953-2959.

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

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

Simonds C.H., Warner J.L. and Phinney W.C. (1973) Petrology of Apollo 16 poikilitic rocks. *Proc. 4th Lunar Sci. Conf.* 613-632.

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. 12th Lunar Planet. Sci. Conf.* 185-207.

Stöffler D., Bischoff A., Borchardt R., Burghel 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. 15th Lunar Planet. Sci. Conf.* in *J. Geophys. Res.* **90**, C449-C506.

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.