

60619
Granoblastic Anorthosite
28 grams



Figure 1: Photo of 60619. NASA S73-20460. Scale in mm/cm.

Introduction

60619 is a rake sample collected 70 m west of the Lunar Module. It is a coherent, recrystallized, plagioclase-rich rock with minor glass-splash and a few micrometeorite craters (figure 1). It has not been well studied.

Petrography

Dowty et al. (1974) and Warner et al. (1976) reported petrographic descriptions of 60619. The granoblastic texture (figure 2) is caused by extensive subsolidus recrystallization. Small anhedral grains of plagioclase have smooth boundaries and meet in triple junctions. The mafic mineral phases occur 1) as small anhedral

grains at these triple junctions, 2) as minute inclusions in the plagioclase or 3) as large grains that enclose small plagioclase.

Mineralogy

Olivine: Olivine is uniform in composition (Fo₇₀).

Pyroxene: Pyroxene compositions determined by Dowty et al. (1974a) and Warner et al. (1976) are illustrated in figure 3.



Figure 2: Thin section photomicrograph of 60619 showing granoblastic texture - mostly plagioclase with minute olivine. Width of field is 4 mm. Crossed nicols. (picture from Dowty et al. 1974).

Plagioclase: Plagioclase is An_{95} . Hansen et al. (1979) determined the trace element composition of plagioclase in 60619.

Ilmenite: Warner et al. (1976) give an analysis of ilmenite.

Chromite: Dowty et al. (1974a) give an analysis of trace chromite found in 60619.

Rutile: A tiny grain of rutile is reported (Dowty et al. 1974a).

Chemistry

The only analysis of 60619 is the broad beam analysis of an area on a thin section (Dowty et al. 1974a, Warner et al. 1976).

Radiogenic age dating

None

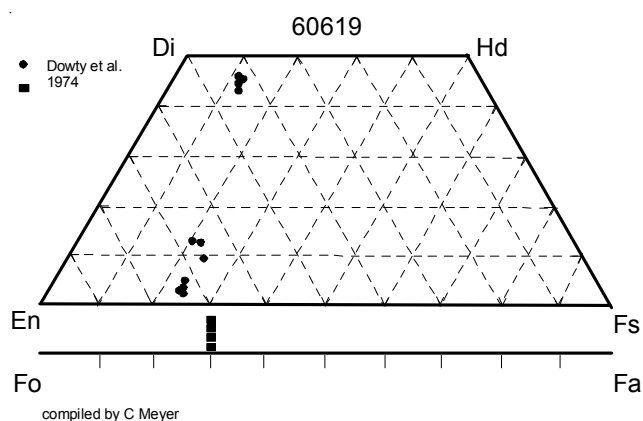


Figure 3: Pyroxene and olivine composition in 60619 (Warner et al. 1976).

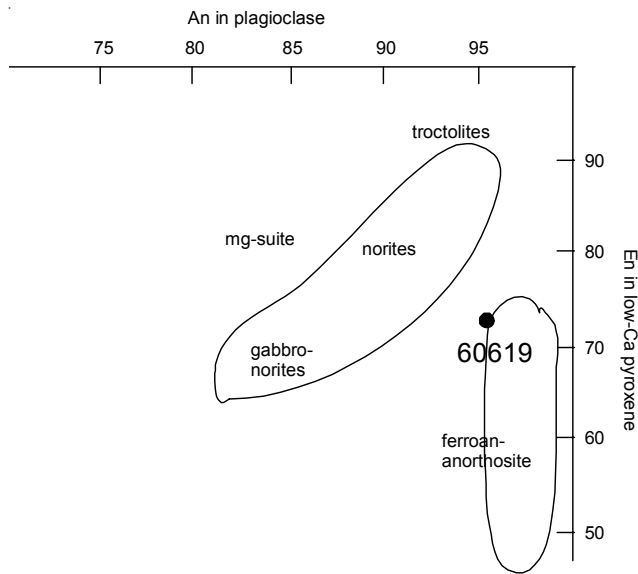


Figure 4: Pyroxene and plagioclase composition in 60619.

Table 1. Chemical composition of 60619.

reference	Dowty 74a	
weight	Warner 76	
SiO ₂ %	44.6	(a)
TiO ₂	0.06	(a)
Al ₂ O ₃	32.9	(a)
FeO	1.2	(a)
MnO	0.01	(a)
MgO	1.68	(a)
CaO	17.8	(a)
Na ₂ O	0.63	(a)
K ₂ O	0.04	(a)
P ₂ O ₅	0.03	(a)
S %		
sum		
Sc ppm		
V		
Cr	68	(a)
Co		

References for 60619

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

Dowty E., Prinz M. and Keil K. (1974b) Ferroan anorthosite: a widespread and distinctive lunar rock type. *Earth Planet. Sci. Lett.* **24**, 15-25.

Hansen E.C., Steele I.M. and Smith J.V. (1979a) Lunar highland rocks: Element partitioning among minerals 1: Electron microprobe analyses of Na, K, and Fe in plagioclase; mg partitioning with orthopyroxene. *Proc. 10th Lunar Planet. Sci. Conf.* 627-638.

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.

Keil K., Dowty E., Prinz M. and Bunch T.E. (1972) Description, classification and inventory of 151 Apollo 16 rake samples from the LM area and station 5. Curator's Catalog, JSC.

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.

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.

Warner R.D., Dowty E., Prinz M., Conrad G.H., Nehru C.E. and Keil K. (1976c) Catalog of Apollo 16 rake samples from the LM area and station 5. Spec. Publ. #13, UNM Institute of Meteoritics, Albuquerque. 87 pp.

