

67746

Noritic Anorthosite

3.5 grams



Figure 1: Photo of mm scale, aluminium foil and 67746 (a metamorphic rock). S72-49567

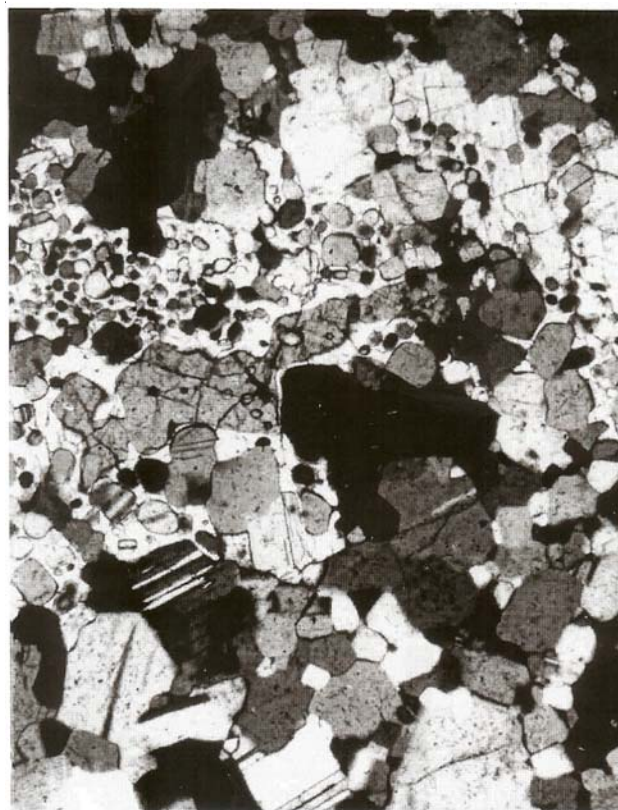


Figure 2: Photomicrograph of thin section 67746,1. 2 mm across. (from Ryder and Norman 1980)

Introduction

67746 is a rake sample collected from the rim of North Ray Crater – see section on 67701. It has both an unusual granoblastic texture and an unusual REE pattern. Particles like this were pictured by John Wood from the coarse fines of Apollo 11 – causing him to speculate on an anorthositic crust for the moon !.

Petrography

67746 has > 75 % plagioclase with a granulitic-poikilitic texture (figure 2). Large pyroxene grains completely surround rounded olivine and plagioclase. Ilmenite and metallic Ni-Fe grains are found between pyroxene oikocrysts. Hansen et al. (1979) gave some mineral analyses (figure 3).

Chemistry

Stoffler et al. (1985) reported analyses for major elements (table) and REE (figure 4). The REE pattern indicates zircon is present.

Radiogenic age dating

Not

Processing

There are 3 thin sections of 67746.

Mineralogical Mode 67746

Stoffler et al. 1985

Plagioclase	75 – 76 %
Pyroxene	13 - 25
Olivine	10
Opaque	0.5

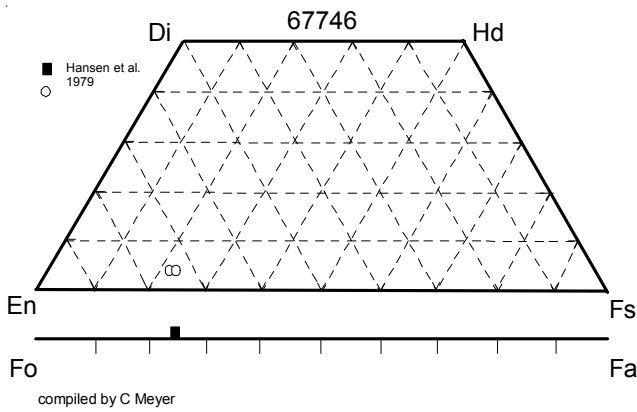
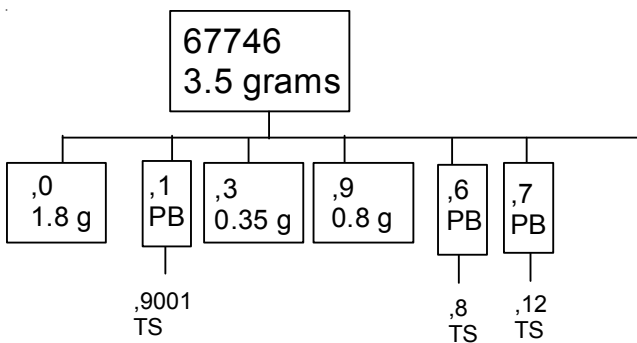


Figure 3: Pyroxene and olivine in 67746.



References for 67746

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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.

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

Table 1. Chemical composition of 67746

reference weight	Stoffler85	Borchardt	Stoffler85
SiO ₂ %	46.7	(a)	,8
TiO ₂	0.21	(a)	0.19 (b)
Al ₂ O ₃	24.77	(a)	23.63 (b)
FeO	5.46	(a)	5.49 (b)
MnO	0.07	(a)	
MgO	9.77	(a)	10.52 (b)
CaO	11.24	(a)	11.64 (b)
Na ₂ O	0.42	(a)	0.4 (b)
K ₂ O	0.05	(a)	0.05 (b)
P ₂ O ₅	0.01	(a)	
S %			
sum			
Sc ppm		7.43	(b)
V			
Cr			
Co		20.4	(b)
Ni		226	(b)
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		62	(b)
La			
Ce			
Pr			
Nd			
Sm		1.06	(b)
Eu			
Gd			
Tb			
Dy			
Ho			
Er			
Tm			
Yb		1.75	(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	

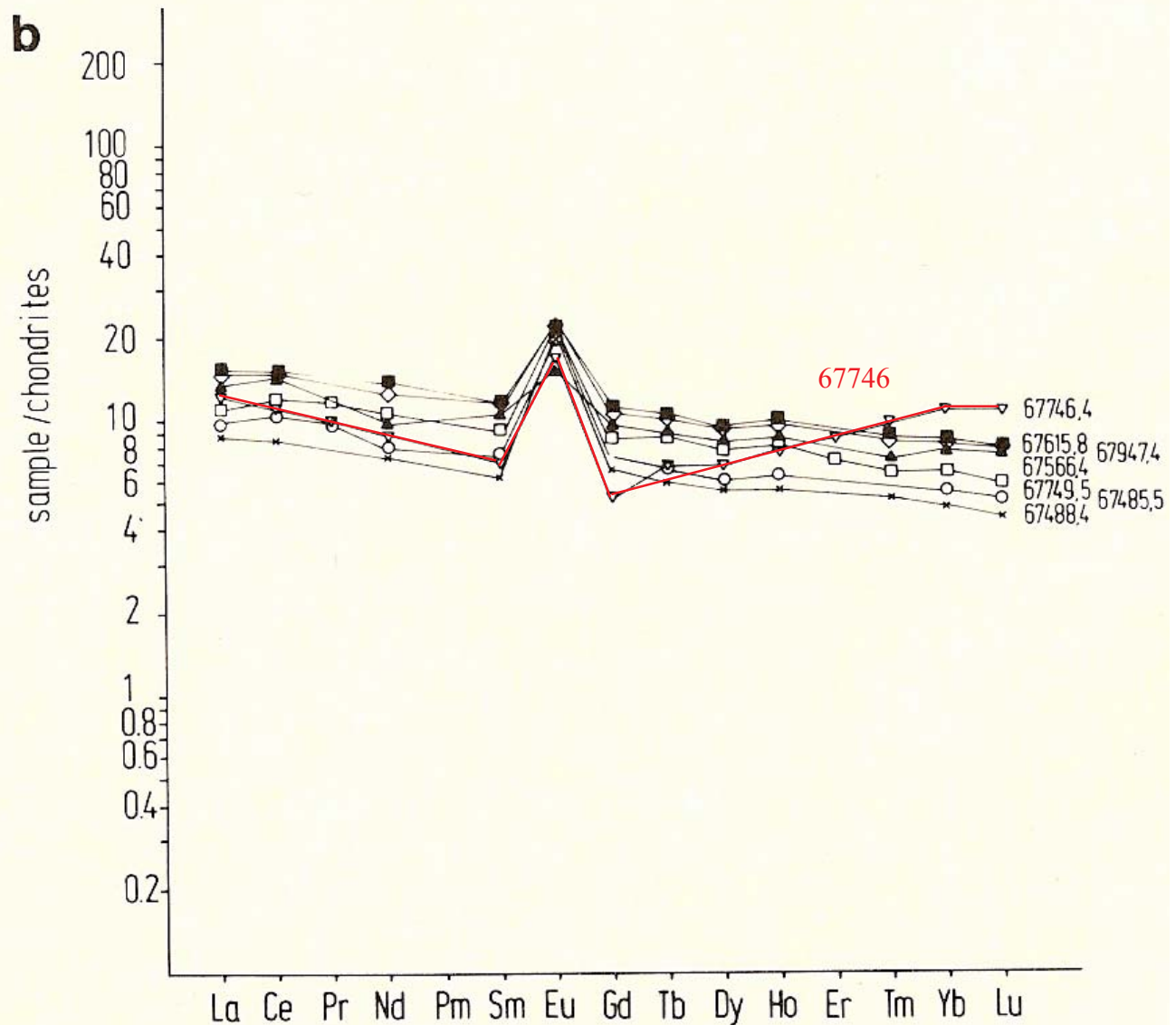


Figure 4: Normalized rare-earth-element diagram for mostly "granulitic breccias" with 67746 shown crossways (from Stoffler et al. 1985)

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

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Stöffler D., Bischoff A., Borchardt R., Burgele 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.

Figure 5: Thin section photos of 67746,8. 2 mm across

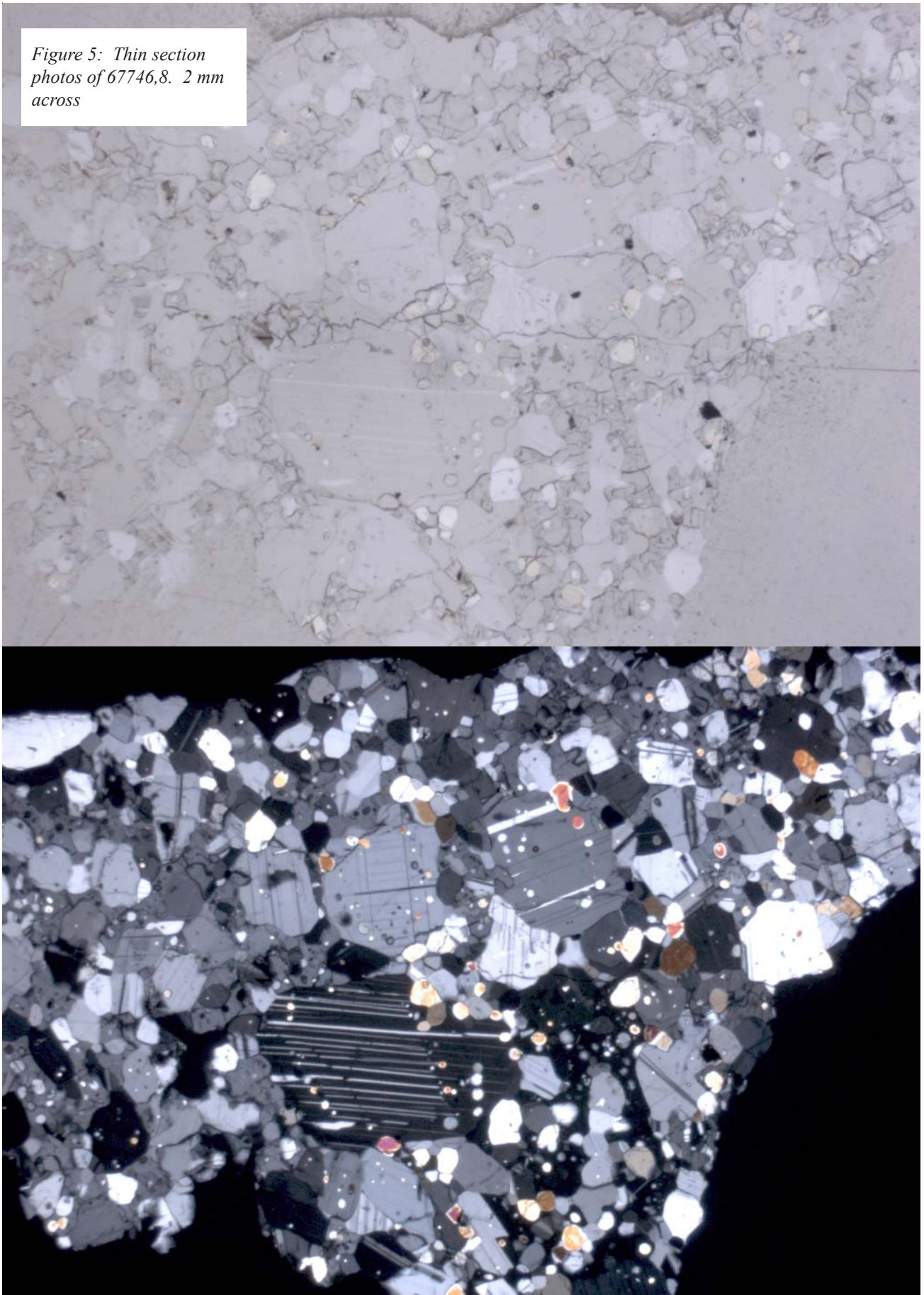


Figure 6: Thin section photos of 67746,12. 2 mm across

