

**71586** – 26.9 grams

**71537** – 12.3 grams

Ilmenite Basalt



Figure 1: Photo of 71586. Scale is 1 cm. S73 -33424. Note zap pits.

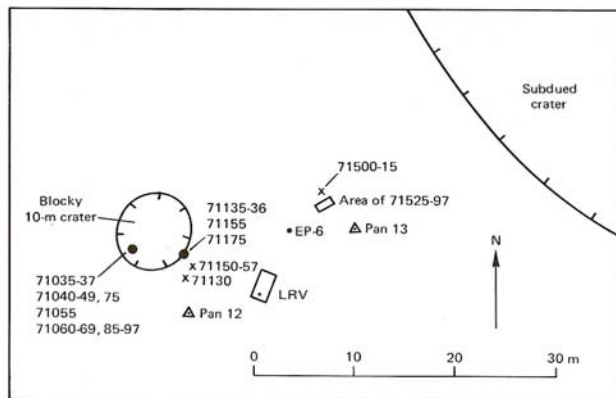


Figure 2: Map of station 1 showing location of rake samples.

### Mineralogical Mode

	<b>71586</b>	<b>71537</b>
Olivine	9.5	6.8
Pyroxene	40.8	40.4
Plagioclase	29.7	30.9
Opagues	14	15.2
Silica	5.1	5.7
Meostasis	0.6	0.7

### Introduction

71525 - 71596 etc. are rake samples collected as part of a comprehensive sample at station 1, taken near Steno Crater, Apollo 17 (figure 2).

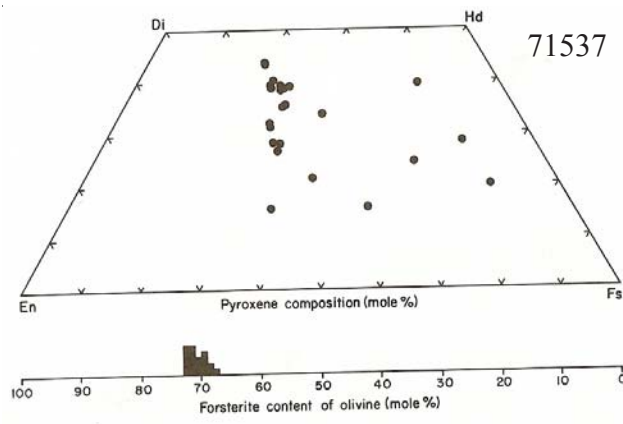
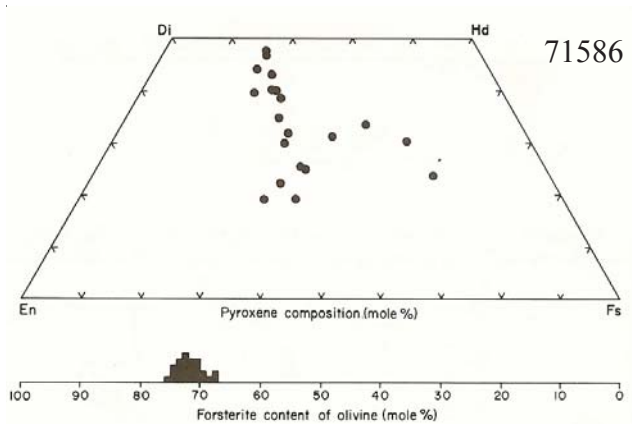


Figure 3: Composition of pyroxene and olivine in 71586 and 71537. Note the Mg.

### Petrography

71586 and 71537 are olivine-microporphyrritic ilmenite basalts (Warner et al. 1978). They are similar to 71569 and 71596.

71586 has a fine-grained variolitic groundmass with small olivine and acicular ilmenite phenocrysts (figure 6). There are abundant chromite inclusions in olivine.

### Chemistry

Murali et al. (1977) give the chemical composition of 30 small Apollo 17 basalts including 71586. It looks like it is a type B basalt (figure 5), although the Ti content is a bit low.

### Radiogenic age dating

None

### Processing

There is one thin section each for 71586 and 71537.

### References for 71586 and 71537

Butler P. (1973) **Lunar Sample Information Catalog Apollo 17**. Lunar Receiving Laboratory. MSC 03211 Curator's Catalog. pp. 447.

LSPET (1973) Apollo 17 lunar samples: Chemical and petrographic description. *Science* **182**, 659-672.

LSPET (1973) Preliminary Examination of lunar samples. Apollo 17 Preliminary Science Rpt. NASA SP-330. 7-1 – 7-46.

Muehlberger et al. (1973) Documentation and environment of the Apollo 17 samples: A preliminary report. *Astrogeology* 71 322 pp superseded by *Astrogeology* 73 (1975) and by Wolfe et al. (1981)

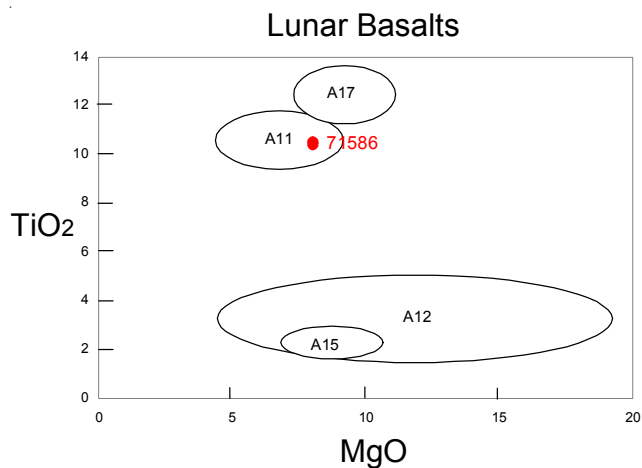


Figure 4: Composition of 71586 compared with Apollo basalts.

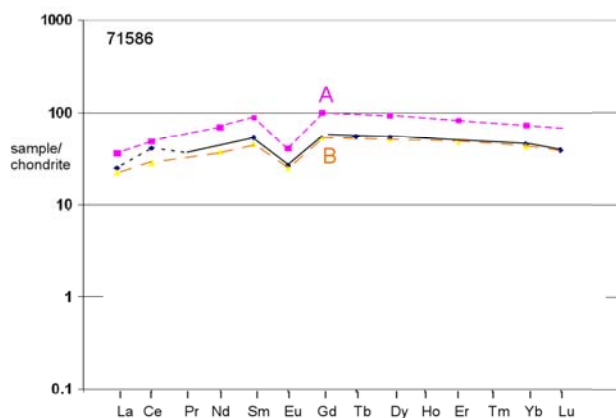
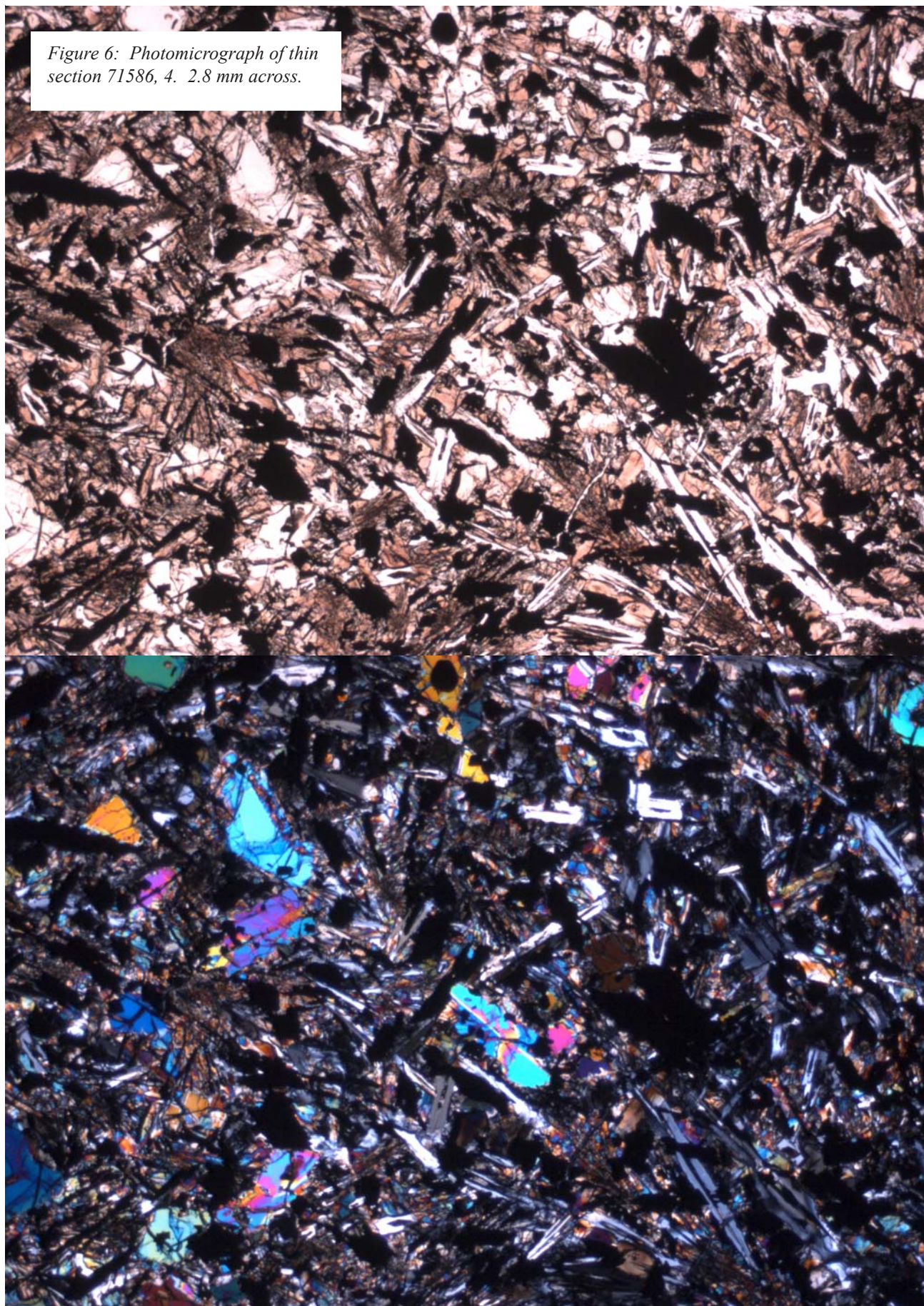


Figure 5: Normalized rare-earth-element diagram for 71586 and type A and B basalts.

Muehlberger W.R. and many others (1973) Preliminary Geological Investigation of the Apollo 17 Landing Site. *In Apollo 17 Preliminary Science Report*. NASA SP-330.



*Figure 6: Photomicrograph of thin section 71586, 4. 2.8 mm across.*





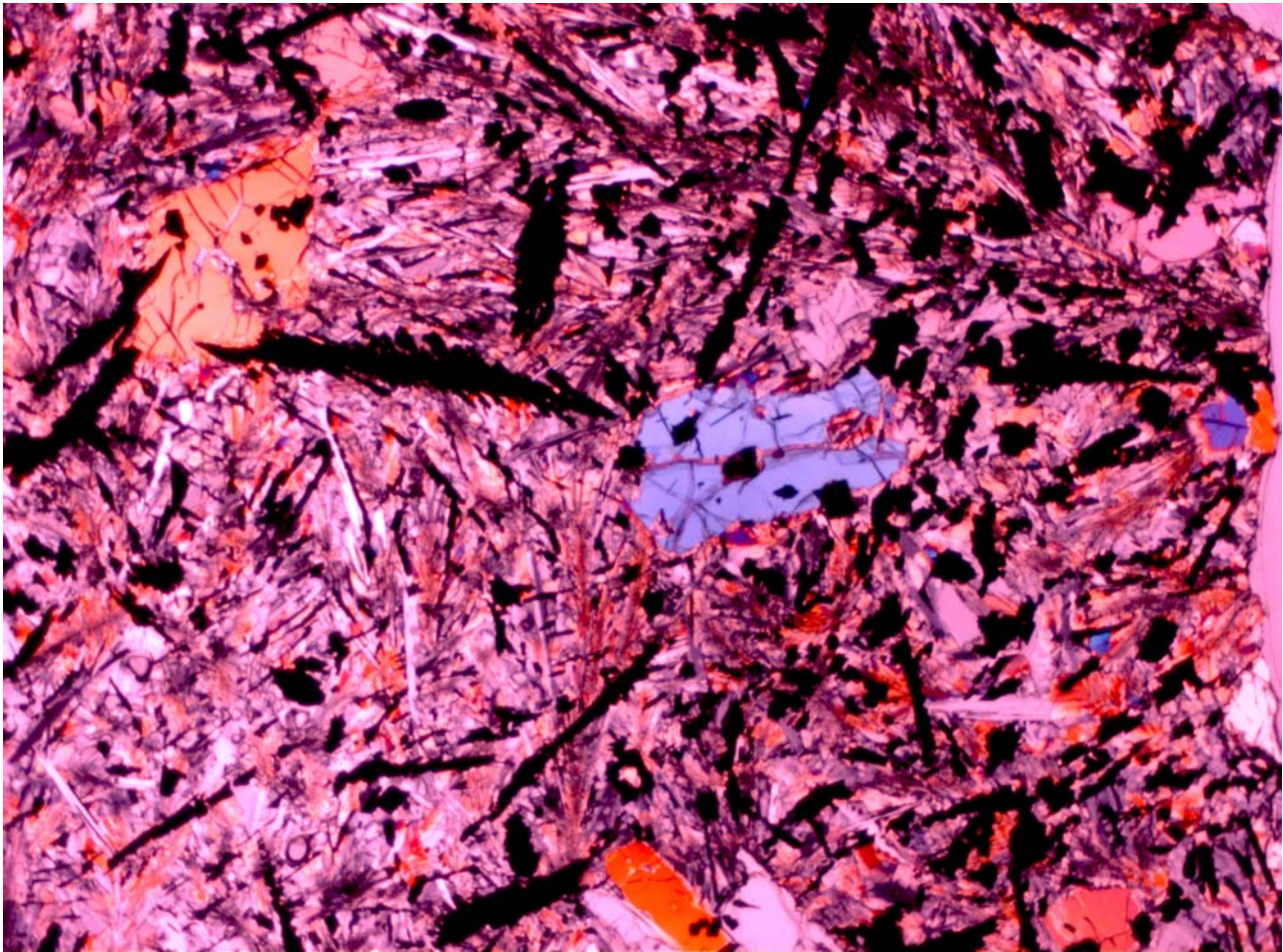


Figure 7: Photomicrograph of thin section 71537,5 showing microprophritic texture. Field of view is 2.8 mm.

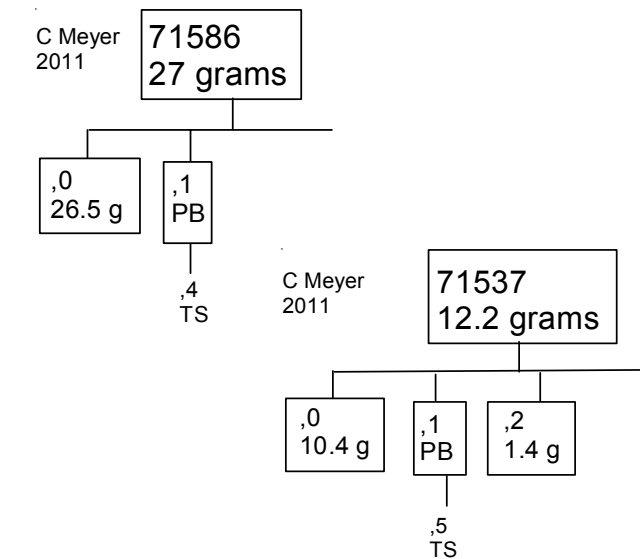
Murali A.V., Ma M.-S., Schmitt R.A., Warner R.D., Keil K. and Taylor G.J. (1977b) Chemistry of 30 Apollo 17 rake basalts; 71597 a product of partial olivine accumulation (abs). *Lunar Sci.* VIII, 703-705. Lunar Planetary Institute, Houston.

Neal C.R. and Taylor L.A. (1993) Catalog of Apollo 17 rocks. Vol. 2 Basalts

Papike J.J., Hodges F.N., Bence A.E., Cameron M. and Rhodes J.M. (1976) Mare basalts: Crystal chemistry, mineralogy and petrology. *Rev. Geophys. Space Phys.* 14, 475-540.

Rhodes J.M., Hubbard N.J., Wiesmann H., Rodgers K.V., Brannon J.C. and Bansal B.M. (1976a) Chemistry, classification, and petrogenesis of Apollo 17 mare basalts. *Proc. 7<sup>th</sup> Lunar Sci. Conf.* 1467-1489.

Warner R.D., Keil K., Nehru C.E. and Taylor G.J. (1978) Catalogue of Apollo 17 rake samples from Stations 1a, 2, 7, and 8. Spec. Publ. #18, UNM Institute of Meteoritics, Albuquerque. 88 pp.



Wolfe E.W., Bailey N.G., Lucchitta B.K., Muehlberger W.R., Scott D.H., Sutton R.L and Wilshire H.G. (1981) The geologic investigation of the Taurus-Littrow Valley: Apollo 17 Landing Site. US Geol. Survey Prof. Paper, 1080, pp. 280.

**Table 1. Chemical composition of 71586.**

<i>reference weight</i>	Murali77	
SiO <sub>2</sub> %		
TiO <sub>2</sub>	10.5	(a)
Al <sub>2</sub> O <sub>3</sub>	9.2	(a)
FeO	19.7	(a)
MnO	0.25	(a)
MgO	8.3	(a)
CaO	9.3	(a)
Na <sub>2</sub> O	0.33	(a)
K <sub>2</sub> O	0.044	(a)
P <sub>2</sub> O <sub>5</sub>	.	
S %		
<i>sum</i>		
Sc ppm	75	(a)
V	131	(a)
Cr	3325	(a)
Co	22	(a)
Ni		
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		
La	5.7	(a)
Ce	38	(a)
Pr		
Nd		
Sm	7.2	(a)
Eu	1.47	(a)
Gd		
Tb	1.9	(a)
Dy	12	(a)
Ho		
Er		
Tm		
Yb	7.3	(a)
Lu	1.11	(a)
Hf	7	(a)
Ta	1.3	(a)
W ppb		
Re ppb		
Os ppb		
Ir ppb		
Pt ppb		
Au ppb		
Th ppm		
U ppm		

*technique: (a) INAA*

**Table 2. Chemical composition of 71537.**

<i>reference weight</i>	Murali77	
SiO <sub>2</sub> %		
TiO <sub>2</sub>	10.9	(a)
Al <sub>2</sub> O <sub>3</sub>	9.7	(a)
FeO	19.3	(a)
MnO	0.257	(a)
MgO	8.2	(a)
CaO	11.2	(a)
Na <sub>2</sub> O	0.37	(a)
K <sub>2</sub> O	0.05	(a)
P <sub>2</sub> O <sub>5</sub>		
S %		
<i>sum</i>		
Sc ppm	78	(a)
V	99	(a)
Cr	2333	(a)
Co	17	(a)
Ni		
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		
La	5.8	(a)
Ce	25	(a)
Pr		
Nd		
Sm	7.9	(a)
Eu	1.47	(a)
Gd		
Tb	2	(a)
Dy	13	(a)
Ho		
Er		
Tm		
Yb	7.4	(a)
Lu	0.94	(a)
Hf	6.8	(a)
Ta	1.4	(a)
W ppb		
Re ppb		
Os ppb		
Ir ppb		
Pt ppb		
Au ppb		
Th ppm		
U ppm		

*technique: (a) INAA*