

**71587** – 41.3 grams  
**71525** – 3.9 grams  
 Ilmenite Basalt



Figure 1: Photo of 71587. Scale in mm. S73-33431

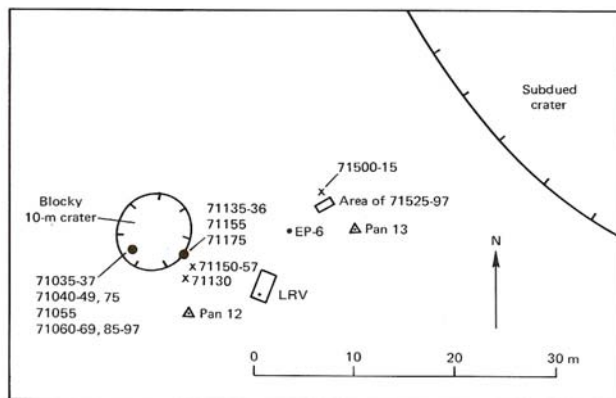


Figure 2: Map of station 1 showing location of rake samples.

### **Introduction**

71587 is a fine grained, vesicular basalt (figure 1).

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

### **Mineralogical Mode**

	<b>71587</b>	<b>71525</b>
Olivine	5.4	6.1
Pyroxene	44.1	43.5
Plagioclase	28.5	27.2
Opaques	18	17.7
Silica	1.7	4.6
Meostasis	1.2	0.8

### **Petrography**

71587 is an olivine-microporphyritic ilmenite basalt similar to 71525 (Warner et al. 1978). It has small olivine and elongate ilmenite phenocrysts set in variolitic to granular groundmass of pyroxene, plagioclase and ilmenite. Armalcolite is mantled by ilmenite. Pyroxene is chemically zoned (figure 3).

### **Chemistry**

Warner et al. (1975) determined the chemical composition of 71587 and Murali et al. (1977) determined 71525 (figures 4 and 5).

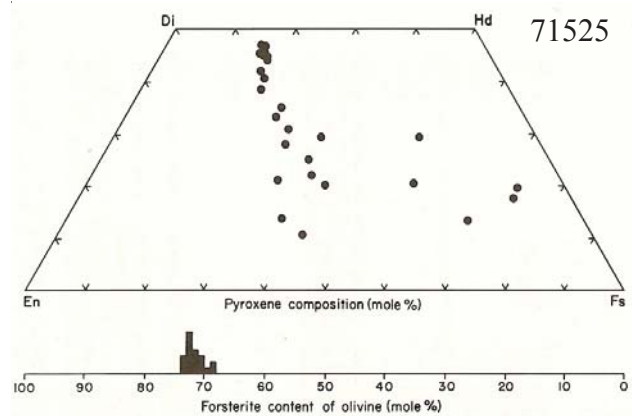
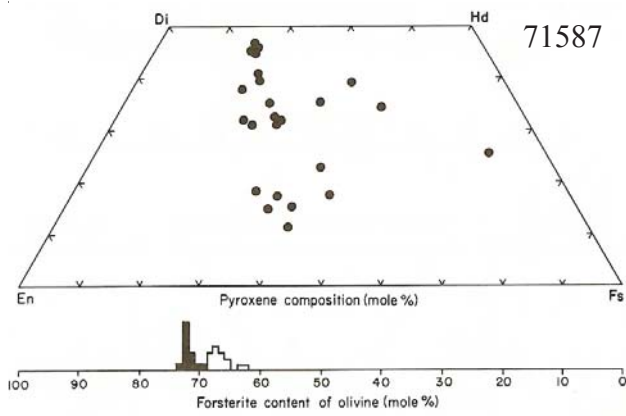


Figure 3: Pyroxene and olivine composition of 71587 and 71525 (Warner et al. 1978).

### Radiogenic age dating

None

### Processing

There is one thin section each.

### References for 71587 and 71525

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 *Astrogeology* 71 322 pp superceded by *Astrogeology* 73 (1975) and by Wolfe et al. (1981)

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.

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

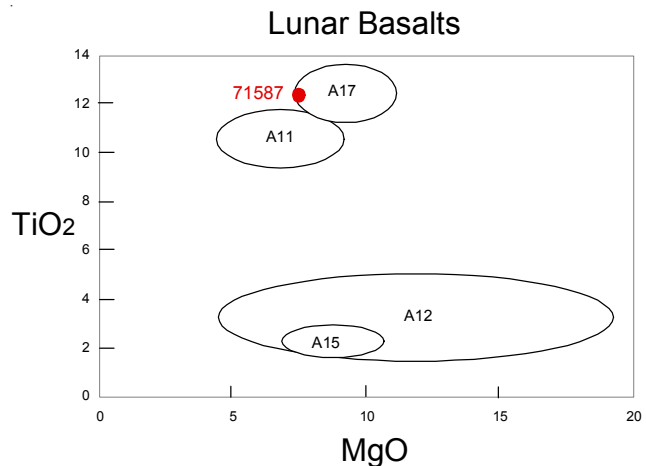


Figure 4: Composition of Apollo basalts.

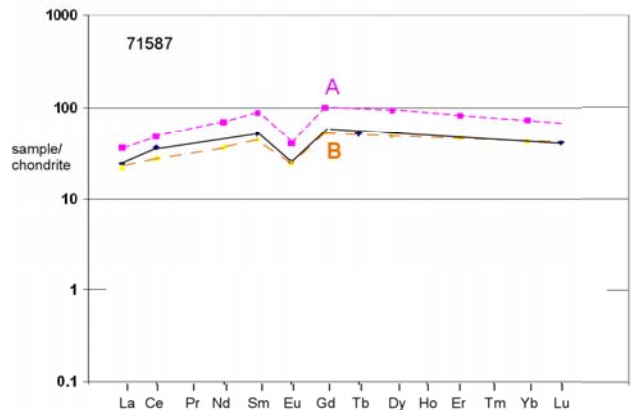
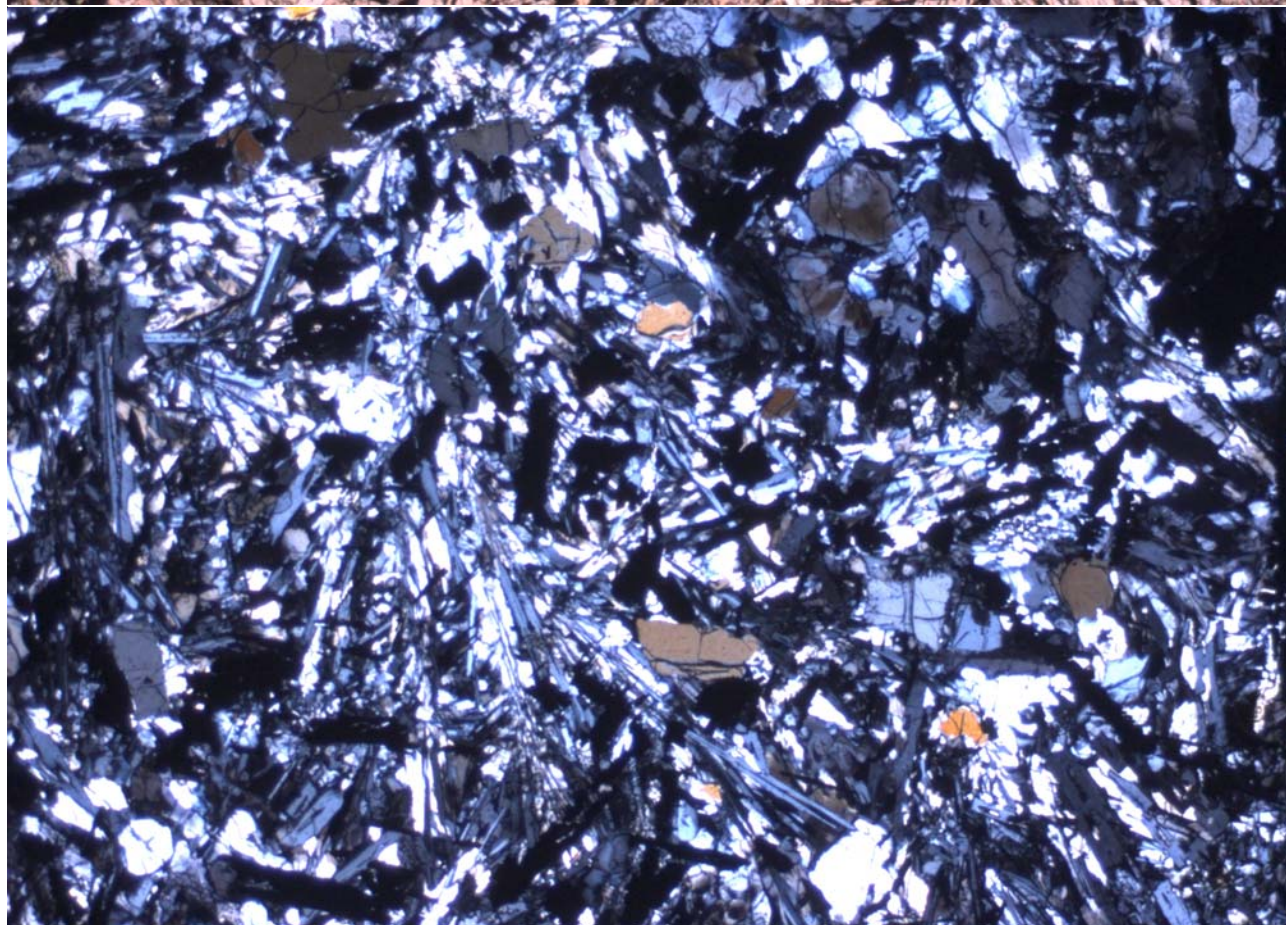
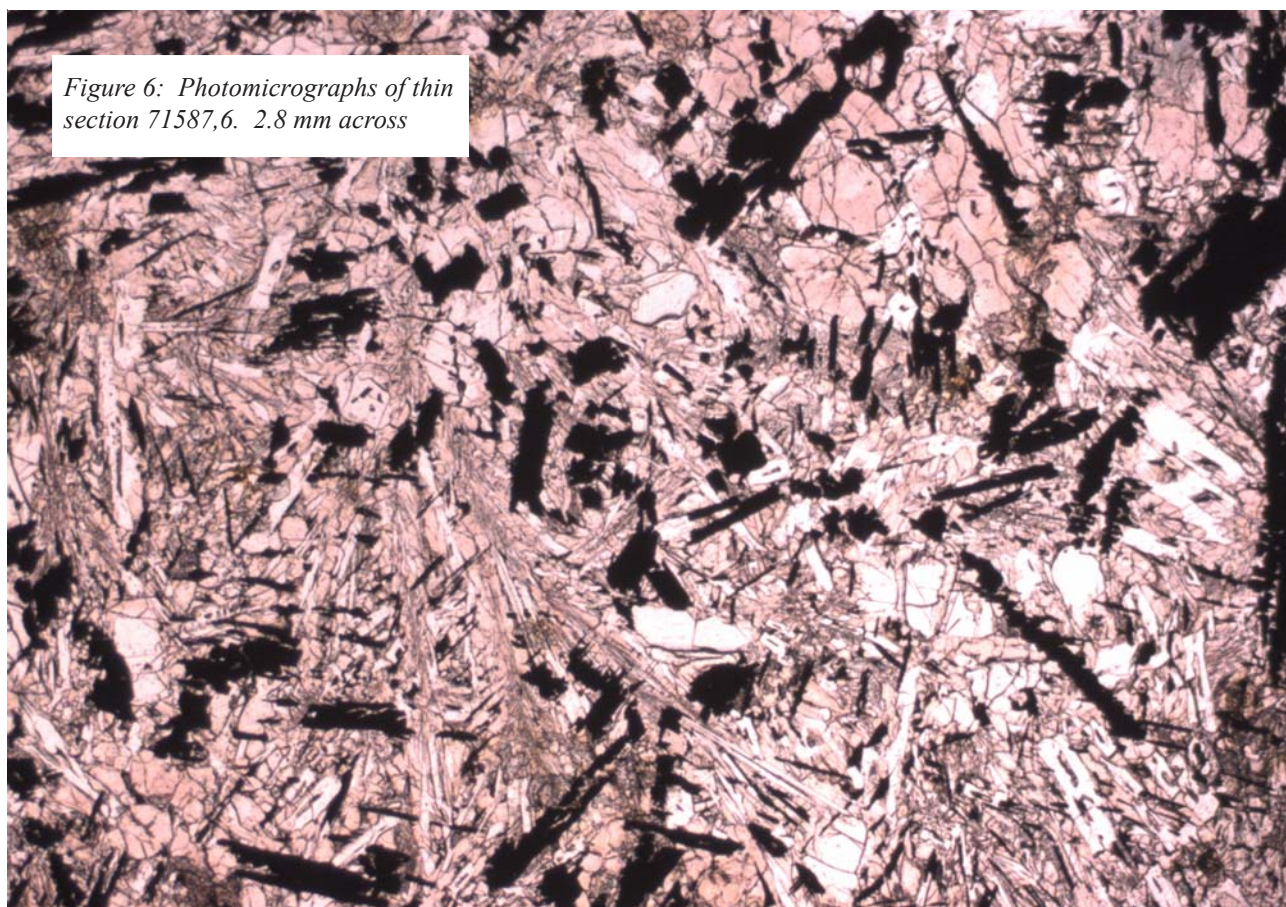


Figure 5: Normalized rare-earth-element diagram for 71587 and type A and B basalts.

Warner R.D., Keil K., Murali A.V. and Schmitt R.A. (1975a) Petrogenetic relationships among Apollo-17 basalts. *In* Papers presented to the **Conference on Origins of Mare Basalts** and their Implications for Lunar Evolution (Lunar Science Institute, Houston), 179-183.

*Figure 6: Photomicrographs of thin section 71587,6. 2.8 mm across*



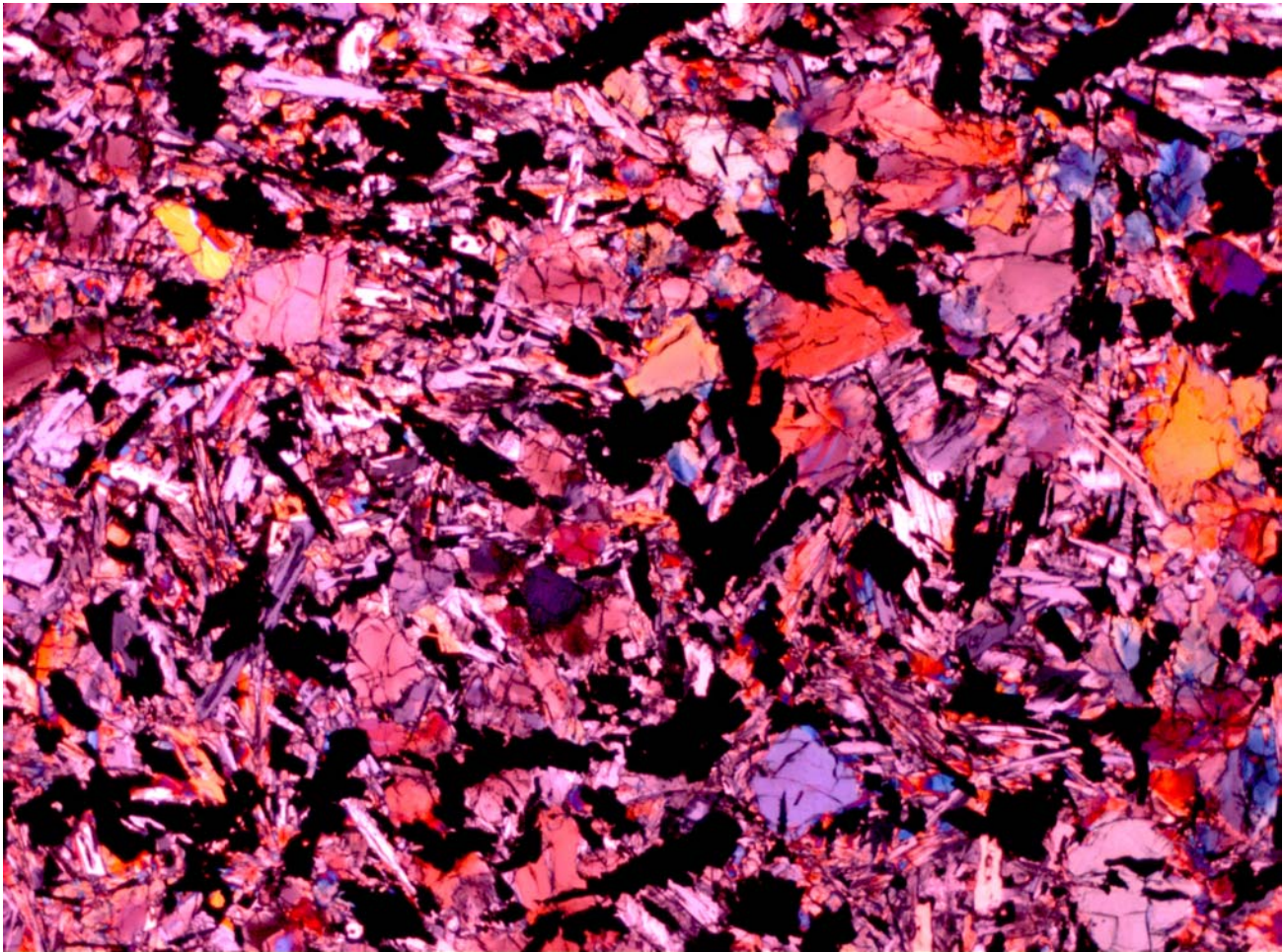
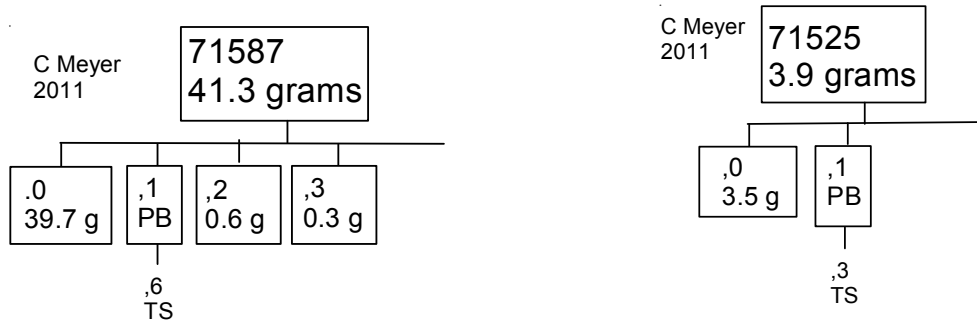


Figure 7: Photomicrograph of 71525, with partially crossed polarizers. 2.8 mm across



Warner R.D., Keil K., Prinz M., Laul J.C., Murali A.V. and Schmitt R.A. (1975b) Mineralogy, petrology, and chemistry of mare basalts from Apollo 17 rake samples. *Proc. 6<sup>th</sup> Lunar Sci. Conf.* 193-220.

Warner R.D., Prinz M. and Keil K. (1975c) Mineralogy and petrology of mare basalts from Apollo 17 rake samples (abs). *Lunar Sci.* VI, 850-852. Lunar Planetary Institute, Houston.

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 71587.**

<i>reference weight</i>	Warner75	
<i>SiO2 %</i>	Warner78	
TiO2	12.7	(a)
Al2O3	8.7	(a)
FeO	19.2	(a)
MnO	0.24	(a)
MgO	7.6	(a)
CaO	10.3	(a)
Na2O	0.39	(a)
K2O	0.05	(a)
P2O5		
S %		
<i>sum</i>		
Sc ppm	80	(a)
V	100	(a)
Cr		(a)
Co	20.8	(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	22	(a)
Pr		(a)
Nd		(a)
Sm	7.6	(a)
Eu	1.4	(a)
Gd		(a)
Tb	1.9	(a)
Dy	12	(a)
Ho		(a)
Er		(a)
Tm		(a)
Yb	6.9	(a)
Lu	1	(a)
Hf	6.2	(a)
Ta	1.6	(a)
W ppb		
Re ppb		
Os ppb		
Ir ppb		
Pt ppb		
Au ppb		
Th ppm		
U ppm		
<i>technique: (a) INAA</i>		

**Table 2. Chemical composition of 71525.**

<i>reference weight</i>	Murali77	
<i>SiO2 %</i>		
TiO2	12.9	(a)
Al2O3	8.8	(a)
FeO	20.8	(a)
MnO	0.246	(a)
MgO	8.2	(a)
CaO	11	(a)
Na2O	0.39	(a)
K2O	0.053	(a)
P2O5		
S %		
<i>sum</i>		
Sc ppm	85	(a)
V	106	(a)
Cr	2682	(a)
Co	20	(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	27	(a)
Pr		
Nd		
Sm	7.5	(a)
Eu	1.43	(a)
Gd		(a)
Tb	2.1	(a)
Dy	13	(a)
Ho		
Er		
Tm		
Yb	7.1	(a)
Lu	0.98	(a)
Hf	6.6	(a)
Ta	1.5	(a)
W ppb		
Re ppb		
Os ppb		
Ir ppb		
Pt ppb		
Au ppb	2	(a)
Th ppm		
U ppm		
<i>technique: (a) INAA</i>		