

**78578**  
Ilmenite Basalt  
17.1 grams



Figure 1: Photo of 68578 with scale bar marked in 1/2 mm intervals (why?). S73-21032

### **Introduction**

78578 is a coarse-grained basalt fragment picked up as part of a large rake sample – see section on 78501.

### **Petrography**

According to Warner et al. (1979), 78578 is a coarse-grained high-Ti basalt, somewhat similar to 71557. In addition to plagioclase, pyroxene, olivine and ilmenite, Cr-spinel, tranquillite, baddeleyite, armalcolite and silica are reported (figure 2). The mineral mode and mineral compositions are given in various catalogs and paper by Warner et al. (figure 3). It's a typical Apollo 17 basalt.

### **Chemistry**

Laul et al. (1975) and Warner et al. (1975) determined the chemical composition (figure 4).

### **Processing**

There is only one thin section.

### **Mineralogical Mode**

*Warner et al. 1978*

|             |       |
|-------------|-------|
| Olivine     | 0.8 % |
| Pyroxene    | 51    |
| Plagioclase | 28.5  |
| Silica      | 2.3   |
| Ilmenite    | 16.1  |
| Metal       | 0.7   |

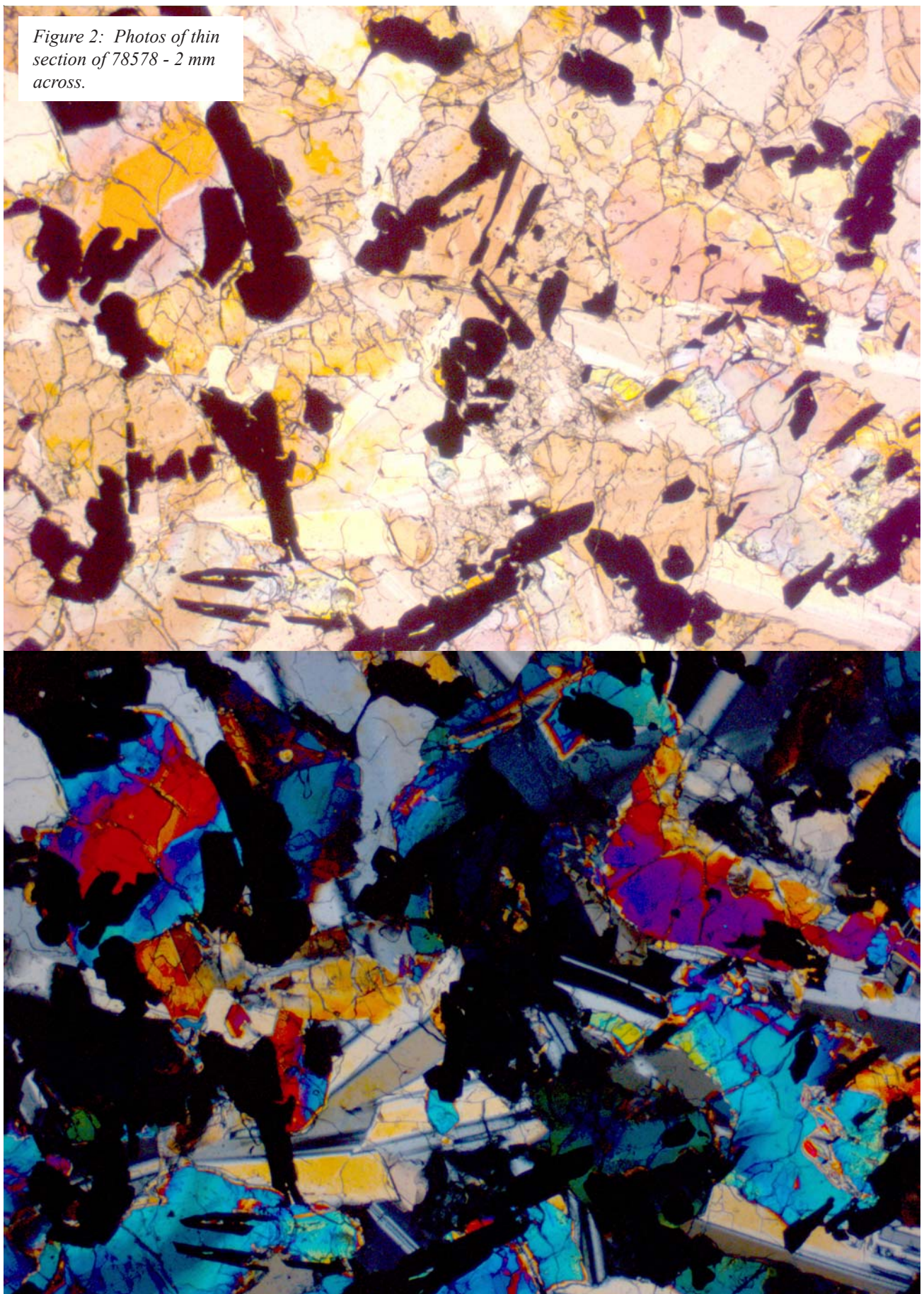
### **References for 78578**

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

Keil K., Dowty E. and Prinz M. (1974) Description, classification and inventory of 113 Apollo 17 rake samples from stations 1A, 2, 7 and 8. Curator's Catalog, pp. 149.

Laul J.C., Schmitt R.A., Robyn M. and Goles G.G. (1975b) Chemical composition of 18 Apollo 17 rake basalts and one basalt-breccia (abs). *Lunar Sci.* VI, 492-494. Lunar Planetary Institute, Houston.

*Figure 2: Photos of thin section of 78578 - 2 mm across.*



**Table 1. Chemical composition of 78578.**

|                                |          |     |
|--------------------------------|----------|-----|
| reference                      | Warner78 |     |
| weight                         | Warner75 |     |
| SiO <sub>2</sub> %             | Laul75   |     |
| TiO <sub>2</sub>               | 11.2     | (a) |
| Al <sub>2</sub> O <sub>3</sub> | 9        | (a) |
| FeO                            | 18.6     | (a) |
| MnO                            | 0.23     | (a) |
| MgO                            | 8.2      | (a) |
| CaO                            | 10       | (a) |
| Na <sub>2</sub> O              | 0.4      | (a) |
| K <sub>2</sub> O               | 0.07     | (a) |
| P <sub>2</sub> O <sub>5</sub>  |          |     |
| S %                            |          |     |
| sum                            |          |     |
| Sc ppm                         | 75       | (a) |
| V                              | 90       | (a) |
| Cr                             | 2874     | (a) |
| Co                             | 19.4     | (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                             | 5.4      | (a) |
| Ce                             | 25       | (a) |
| Pr                             |          |     |
| Nd                             | 22       | (a) |
| Sm                             | 8.6      | (a) |
| Eu                             | 1.9      | (a) |
| Gd                             |          |     |
| Tb                             | 2.2      | (a) |
| Dy                             | 14       | (a) |
| Ho                             |          |     |
| Er                             |          |     |
| Tm                             |          |     |
| Yb                             | 7.8      | (a) |
| Lu                             | 1.1      | (a) |
| Hf                             | 7.7      | (a) |
| Ta                             | 1.5      | (a) |
| W ppb                          |          |     |
| Re ppb                         |          |     |
| Os ppb                         |          |     |
| Ir ppb                         |          |     |
| Pt ppb                         |          |     |
| Au ppb                         |          |     |
| Th ppm                         |          |     |
| U ppm                          |          |     |
| technique:                     | (a) INAA |     |

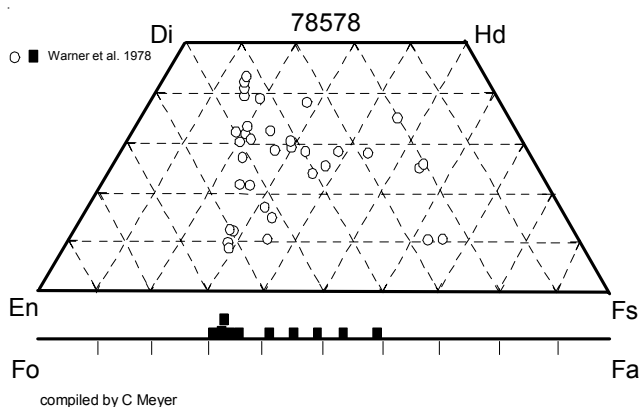


Figure 3: Composition of olivine and pyroxene in 78578.

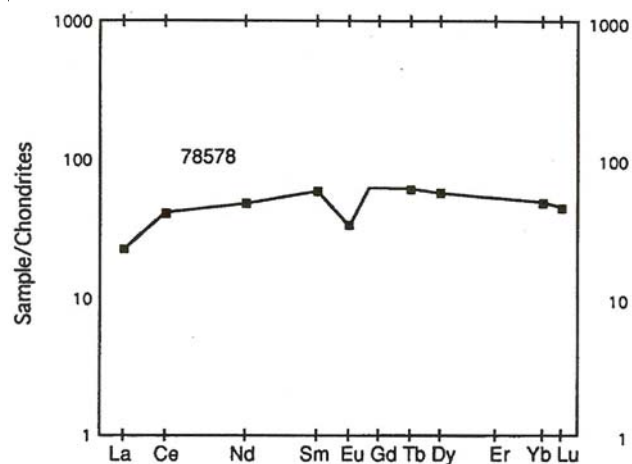


Figure 4: Normalized rare-earth-element diagram of 78578.

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Warner R.D., Taylor G.J., Conrad G.H., Northrop H.R., Barker S., Keil K., Ma M.-S. and Schmitt R. (1979a) Apollo 17 high-Ti mare basalts: New bulk compositional data, magma types, and petrogenesis. *Proc. 10<sup>th</sup> Lunar Planet. Sci. Conf.* 225-247.

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