

**71509****High-Ti Mare Basalt**  
**1.69 g, 2 x 1.5 x 0.5 cm****INTRODUCTION**

71509 was described as a variegated white to light brown, intergranular, homogeneous, coarse-grained basalt (Apollo 17 Lunar Sample Information Catalog, 1973). It contains glomerophyric aggregates of pyroxene and ilmenite in a white plagioclase matrix (Fig. 1a,b). The rock is too friable for the preservation of zap pits and 1% vesicles are exposed on a fresh fracture surface - none are on the original top or bottom. 71509 has broken into three pieces (Fig. 1b), but was a flat

fragment before handling. This basalt was collected from Station 1A.

**PETROGRAPHY AND MINERAL CHEMISTRY**

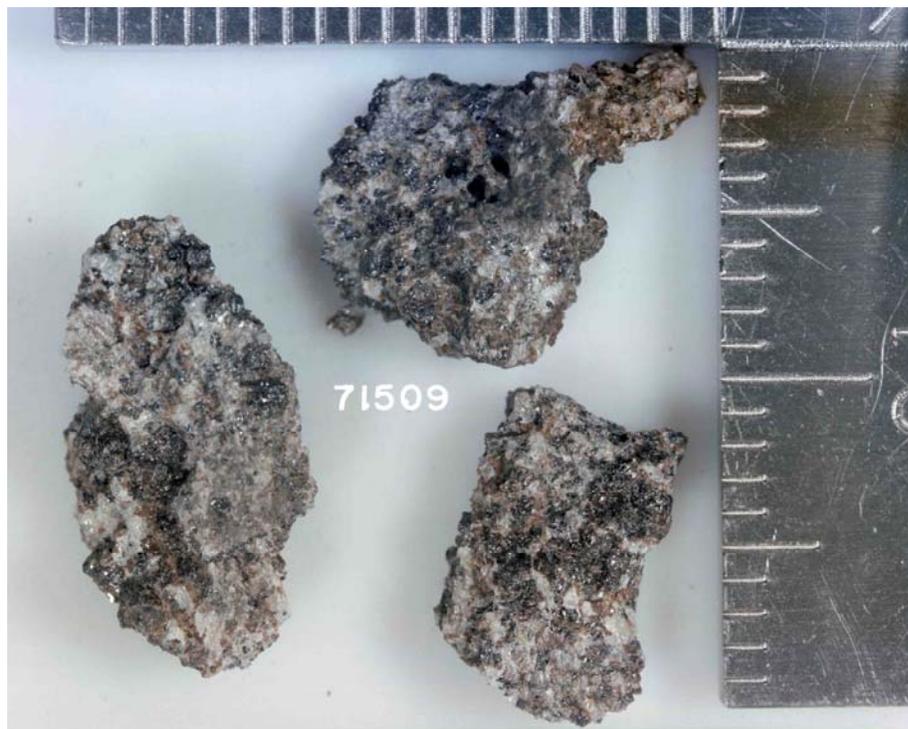
The petrography and mineral chemistry has been reported by Warner et al. (1976ab, 1978). Warner et al. (1975) described 71509 as a plagioclase-poikilitic ilmenite basalt, but did not elaborate and did not mention mineral chemistry. During the preparation of this catalog we examined thin section 71509,5

and found it to be dominated by plagioclase and pyroxene. It is a coarse-grained (up to 2mm) plagioclase-poikilitic basalt, containing interstitial, blocky ilmenite (up to 2mm). No olivine or armalcolite are present, but interstitial  $\text{SiO}_2$  is conspicuous. Rutile and chromite exsolution lamellae (< 0.1mm wide) are present in the ilmenite. Rare opaque glass is associated with ilmenite. Native Fe and troilite are either associated with the ilmenite or form ~0.1mm interstitial phases.



1 a: Cubic scale = 1 cm<sup>3</sup>.

Figure 1: Hand specimen photographs of 71509.



1b: Small divisions on scale are in millimeters.

Figure 1: Hand specimen photographs of 71509.

### WHOLE ROCK-CHEMISTRY

Warner et al. (1975) reported the whole-rock composition of 71509 (given in Table 1). 71509,1 contains 13.7 wt%  $\text{TiO}_2$  with a MG# of 47.1. 71509 is classified as a Type C Apollo 17 high-Ti basalt using the whole-rock classification of Rhodes et al. (1976). The REE profile (Fig. 2) is LREE-depleted with constant middle and heavy REE abundances at  $\sim 43$  times chondritic levels. A negative Eu anomaly is present [ $(\text{Eu}/\text{Eu}^*)_N = 0.5$ ].

### PROCESSING

Of the original 1.69g of 71509,0, a total of 1.358 remains.

71509,1 was used for INAA, and thin section,5 was taken from this irradiated sample.

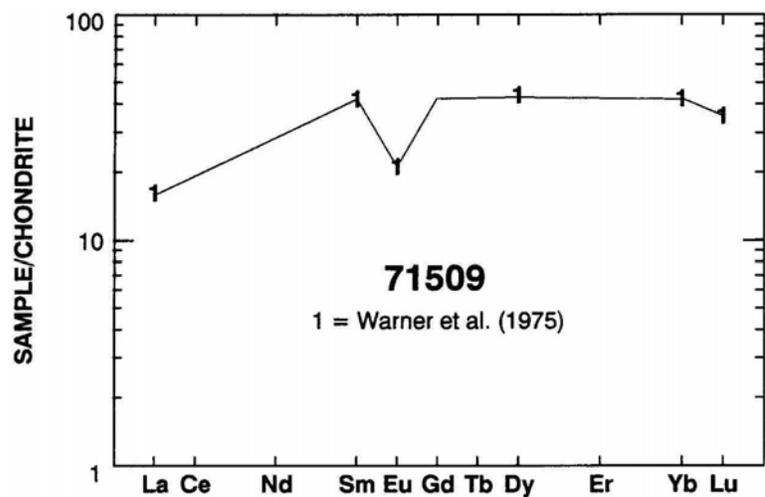


Figure 2: Chondrite -normalized rare-earth element plot of 71509. Data from Warner et al. (1975).

**Table 1: Whole-rock chemistry of 71509.**  
Data from Warner et al. (1975).

|                                | <b>71509,1<br/>Method N</b> |          | <b>71509,1<br/>Method N</b> |
|--------------------------------|-----------------------------|----------|-----------------------------|
| SiO <sub>2</sub> (wt %)        |                             | Cu       |                             |
| TiO <sub>2</sub>               | 13.7                        | Ni       |                             |
| Al <sub>2</sub> O <sub>3</sub> | 7.3                         | Co       | 24.5                        |
| Cr <sub>2</sub> O <sub>3</sub> | 0.647                       | V        | 160                         |
| FeO                            | 20.6                        | Sc       | 95                          |
| MnO                            | 0.258                       | La       | 5.3                         |
| MgO                            | 10.3                        | Ce       |                             |
| CaO                            | 9.6                         | Nd       |                             |
| Na <sub>2</sub> O              | 0.314                       | Sm       | 8.5                         |
| K <sub>2</sub> O               | 0.054                       | Eu       | 1.62                        |
| P <sub>2</sub> O <sub>5</sub>  |                             | Gd       |                             |
| S                              |                             | Tb       |                             |
| Nb (ppm)                       |                             | Dy       | 15                          |
| Zr                             |                             | Er       |                             |
| Hf                             |                             | Yb       | 9.3                         |
| Ta                             |                             | Lu       | 1.2                         |
| U                              |                             | Ga       |                             |
| Th                             |                             | F        |                             |
| W                              |                             | Cl       |                             |
| Y                              |                             | C        |                             |
| Sr                             |                             | N        |                             |
| Rb                             |                             | H        |                             |
| Li                             |                             | He       |                             |
| Ba                             |                             | Ge (ppb) |                             |
| Cs                             |                             | Ir       |                             |
| Be                             |                             | Au       |                             |
| Zn                             |                             | Eu       |                             |
| Pb                             |                             | Os       |                             |

Analysis by: N = INAA.