

**70315****High-Ti Mare Basalt****148.6 g, 5 x 4.5 x 4.5 cm****INTRODUCTION**

70315 was described as a white, black, and brown high-Ti mare basalt (Apollo 17 Lunar Sample Information Catalog, 1973), with 5-10% vugs (up to 1cm diameter) homogeneously distributed throughout (Fig. 1). The fabric is primarily intergranular with local development of glomeroporphyritic clots of pyroxene and ilmenite - the largest is 3mm. This basalt was collected from LRV 12.

**PETROGRAPHY AND MINERAL CHEMISTRY**

70315 was described as a Type IB Apollo 17 high-Ti basalt by Brown et al. (1975ab), composed of 0.7% olivine; 25.5% opaque minerals; 22.0% plagioclase; 50.6% clinopyroxene; 0.6% silica; and 0.6% mesostasis. These authors described the petrography and mineral chemistry within the general context of Type IB basalts, without specifically mentioning 70315.

In the preparation of this catalog, we examined thin section 70315,27. This basalt is coarse grained (2-3mm), with ilmenite (up to 0.5mm) and rare armalcolite (~ 0.1 mm) included in pyroxene (up to 1.2mm), and plagioclase (2-3mm) poikilitically including all other minerals. Occasionally, pyroxene and plagioclase are intergrown forming "bow-tie" structures (Fig. 2). Ilmenite

may also be interstitial. Small (<0.1 mm), rare olivines form the cores of pyroxenes. Silica, native Fe, and troilite form interstitial phases.

**WHOLE-ROCK CHEMISTRY**

Ma et al. (1979) and Warner et al. (1979) reported the same

whole-rock analysis for 70315,10. This basalt was classified as a Type U by Warner et al. (1979). 70315 contains 13.1 wt% TiO<sub>2</sub> (Table 1) with a MG# of 49.9. The REE profile (Fig. 3) is LREE depleted with the HREE reaching ~ 25 times chondritic values. There is a negative Eu anomaly present ( $[Eu/Eu^*]_N = 0.67$ ). Garg and

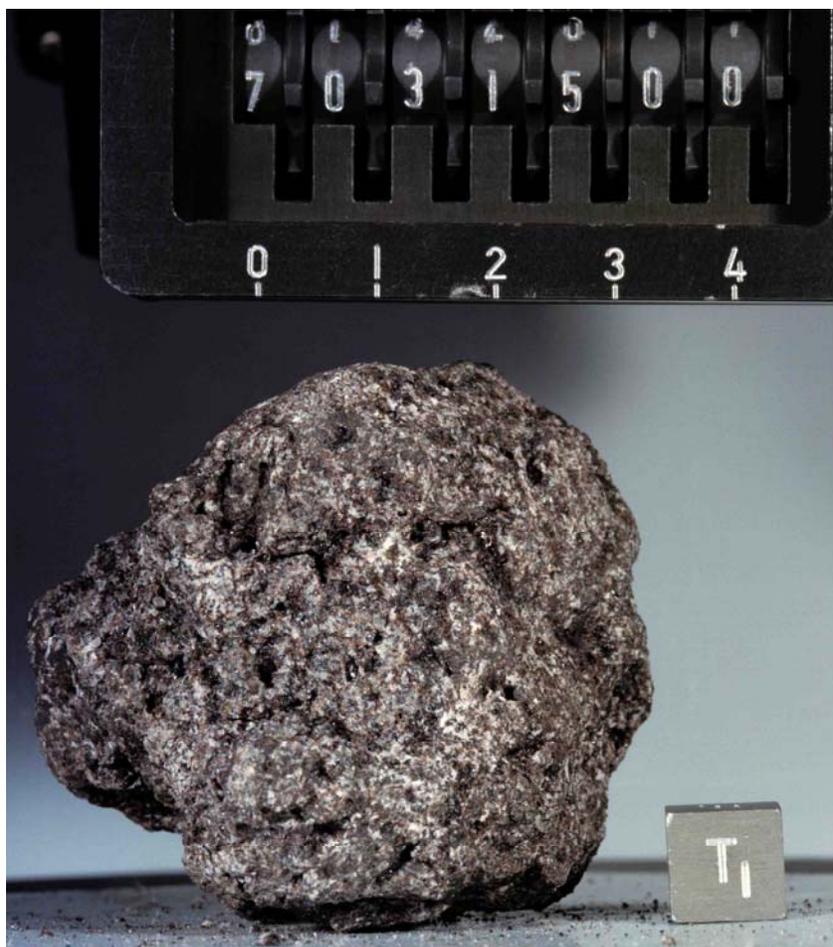


Figure 1: Hand specimen photograph of 70315,0.



Figure 2: Photomicrograph of 70315,14. Field of view is 2.5 mm.

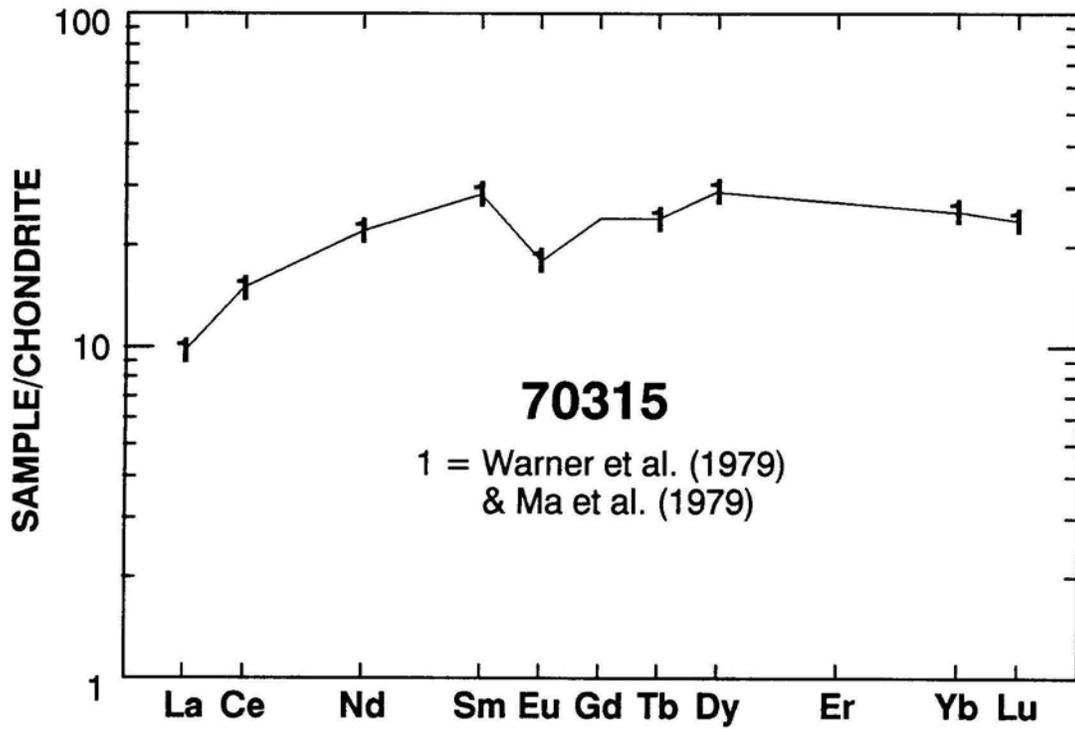


Figure 3: Chondrite -normalized rare-earth element profile of 70315.

**Table 1: Whole-rock chemistry of 70315.**  
 Data from Ma et al. (1979) and Warner et al. (1979) (same analysis).

	70315,10 I		70315,10 I
SiO <sub>2</sub> (wt %)		Cu	
TiO <sub>2</sub>	13.1	Ni	
Al <sub>2</sub> O <sub>3</sub>	9.3	Co	20
Cr <sub>2</sub> O <sub>3</sub>	0.547	V	148
FeO	17.9	Sc	81
MnO	0.240	La	3.2
MgO	10	Ce	13
CaO	10.2	Nd	14
Na <sub>2</sub> O	0.387	Sm	5.8
K <sub>2</sub> O	0.039	Eu	1.40
P <sub>2</sub> O <sub>5</sub>		Gd	
S		Tb	1.4
Nb (ppm)		Dy	10
Zr		Er	
Hf	5.7	Yb	5.6
Ta	1.3	Lu	0.81
U		Ga	
Th		F	
W		Cl	
Y		C	
Sr		N	
Rb		H	
Li		He	
Ba		Ge (ppb)	
Cs		Ir	
Be		Au	
Zn		Ru	
Pb		Os	

I = Analysis by INAA.

Ehmann (1976) reported Zr (~ 205 ppm) and Hf (~ 8 ppm) contents of 70315. The Hf abundance reported by these authors is ~ 2 ppm greater than that reported by Warner et al. (1979) and Ma et al. (1979).

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**ISOTOPES**

Only cosmic-ray induced radionuclide abundances

(Table 2) have been determined for 70315 (Eldridge et al., 1975ab). No radiogenic or stable isotope studies have been undertaken on this sample.

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**PROCESSING**

Of the original 148.6g, 131.5g of 70315,0 remains. Four thin sections have been made (70315,14 ,26-28) and two

irradiations for INAA (70315,4 and ,10). The largest subsample of 70315,0 is 70315,3, which has in turn been extensively subdivided

**Table 2: Cosmogenic radionuclide and radioelement abundances of 70315.**  
Data from Eldridge et al. (1975ab).

Th (ppm)	0.27 + 0.02
U (ppm)	0.10 + 0.01
K (ppm)	400 + 20
<sup>22</sup> Na	82 + 8
<sup>26</sup> Al	67 + 8
<sup>54</sup> Mn	165 + 10
Th/U	2.70 + 0.34
K/U	4000 + 450