15612 MEDIUM-GRAINED OLIVINE-NORMATIVE MARE BASALT ST. 9A 746.6 g

INTRODUCTION: 15612 is a medium-grained olivine-bearing mare basalt which is very vesicular (Fig. 1). A few olivines form phenocrysts. In chemistry the sample appears to be an Mg-rich member of the Apollo 15 olivine-normative mare basalt group. It is tough with the porphyritic olivines macroscopically visible. 15612 was collected as part of the rake sample at Station 9A.

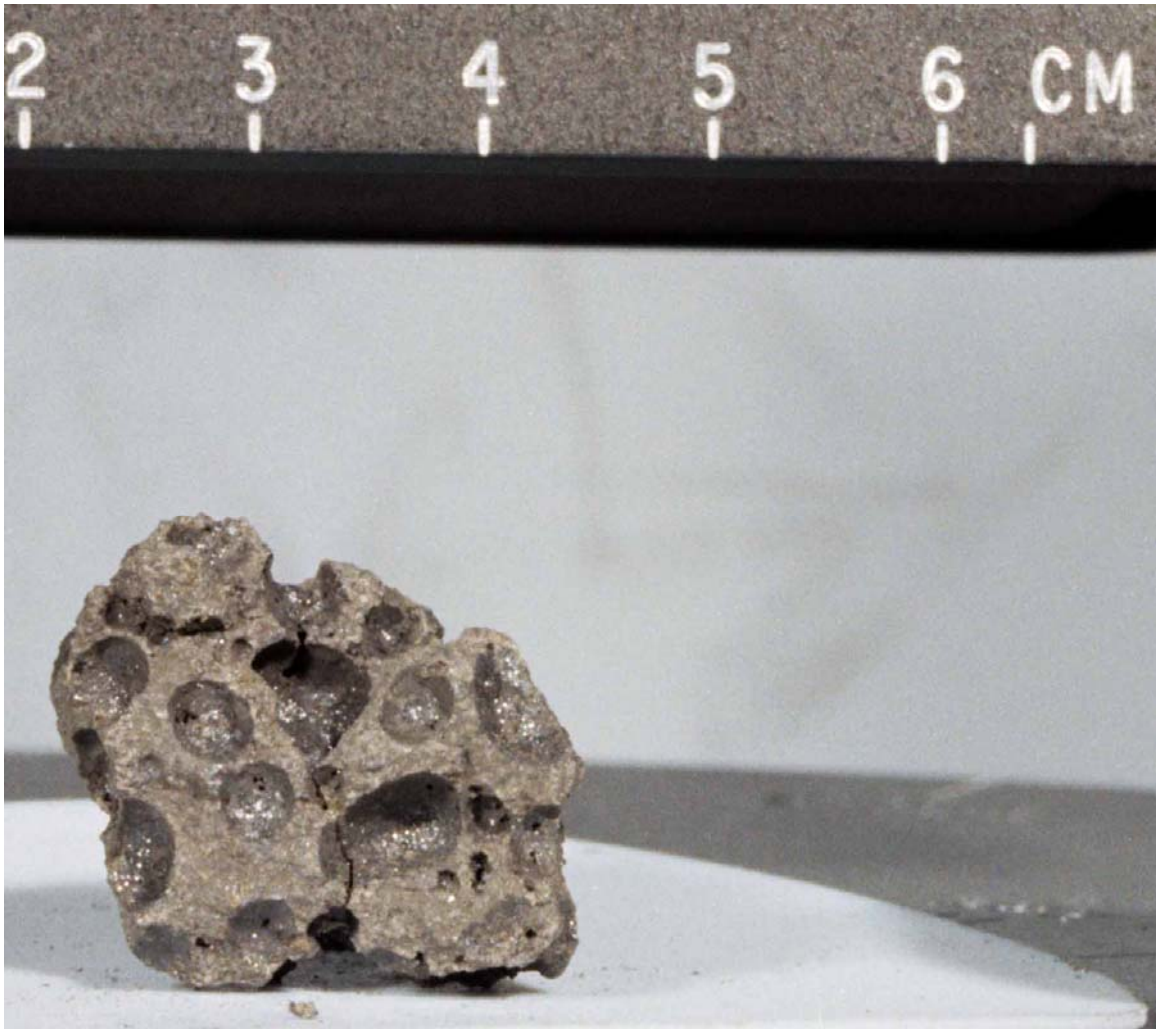

Figure 1. Pre-chip view of 15612. S-71-49066

PETROLOGY: 15612 is a medium-grained olivine-bearing mare basalt (Fig. 2) with some of the olivine forming anhedral phenocrysts up to 2 mm long. Plagioclase laths project into their exteriors in a peculiar multiple needle-like fashion. The dominant phase is pyroxene in large and small grains. Residual phases include fayalite (sieved and unsieved), cristobalite, glass, ulvospinel and ilmenite, and troilite. The sample is very vesicular, and many of the vesicles are lined with opaque minerals, mainly ulvospinel.

CHEMISTRY: A bulk chemical analysis, listed in Table 1 and with rare earths shown in Figure 3, shows the sample to be a member of the Apollo 15 olivine-normative mare basalt group. The low TiO_2 and the (imprecisely measured) high MgO suggest that the sample is not average but an Mg-enriched sample.

PROCESSING AND SUBDIVISIONS: Original chipping produced some small chips (,1), and a larger chip (,2). The latter was partly used to make thin sections ,6 and ,13. In 1976 three of the larger chips composing ,1 were allocated for chemistry and a third thin section (,10) also made from them. ,0 is now 4.60 g.

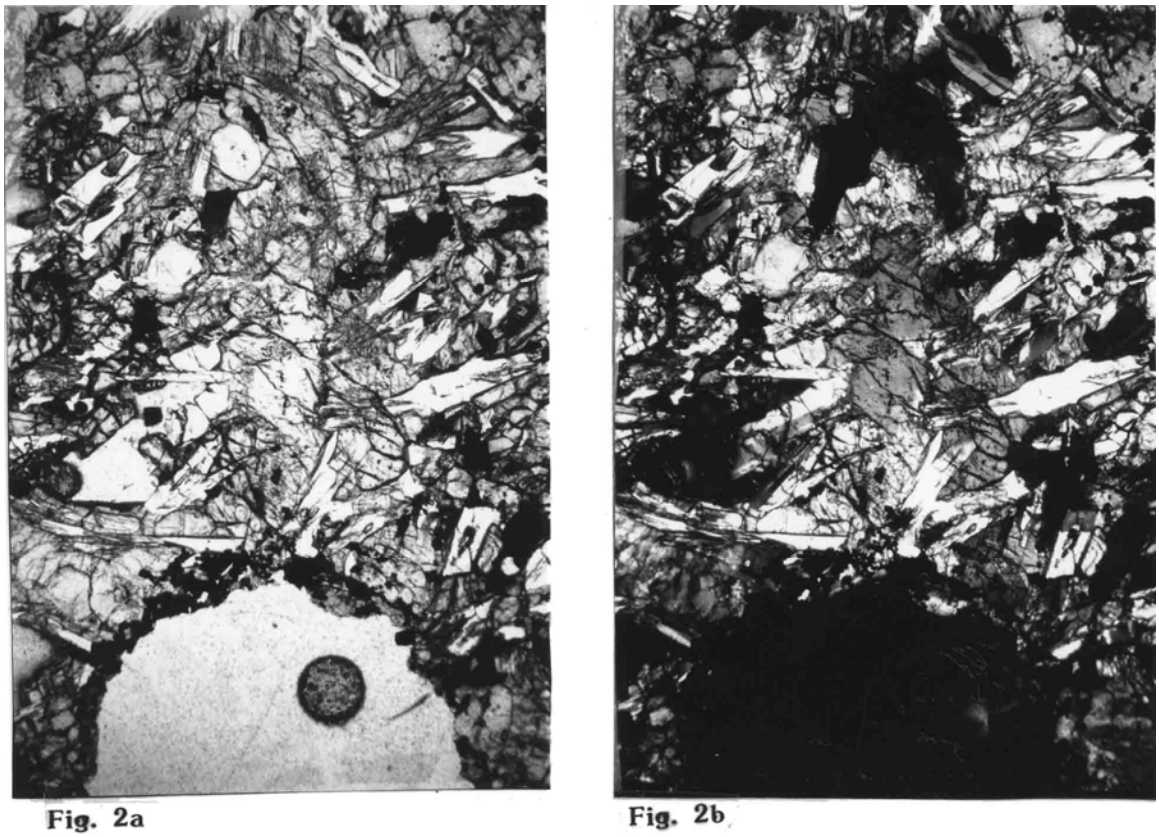

Figure 2. Photomicrographs of 15612,13. Widths about 3 mm. At bottom is opaque-lined vesicle. Center is an olivine phenocryst with plagioclase projecting into it. a) transmitted light; b) crossed polarizers.

TABLE 15612-1. Bulk rock chemical analysis

		,3
Wt %	SiO2	
	TiO2	2.2
	Al2O3	8.5
	FeO	22.2
	MgO	12
	CaO	9.2
	Na2O	0.244
	K2O	0.037
	P2O5	
(ppm)	Sc	37
	V	208
	Cr	5500
	Mn	2015
	Co	52
	Ni	65(a)
	Rb	
	Sr	
	Y	
	Zr	
	Nb	
	Hf	2.7
	Ba	50(b)
	Th	
	U	
	Pb	
	La	5.5
	Ce	
	Pr	
	Nd	
	Sm	3.6
	Eu	0.84
	Gd	
	Tb	0.7
	Dy	4.2
	Ho	
	Er	
	Tm	
	Yb	2.2
	Lu	0.31
	Li	
	Be	
	B	
	C	
	N	
	S	
	F	
	Cl	
	Br	
	Cu	
	Zn	
(ppb)	I	
	At	
	Ga	
	Ge	
	As	
	Se	
	Mo	
	Tc	
	Ru	
	Rh	
	Pd	
	Ag	
	Cd	
	In	
	Sn	
	Sb	
	Te	
	Cs	
	Ta	460
	W	
	Re	
	Os	
	Ir	
	Pt	
	Au	
	Hg	
	Tl	
	Bi	
		(1)

References and methods:

(1) Ma et al. (1978); INAA

Notes:

(a) ± 30 ppm
(b) ± 40 ppm

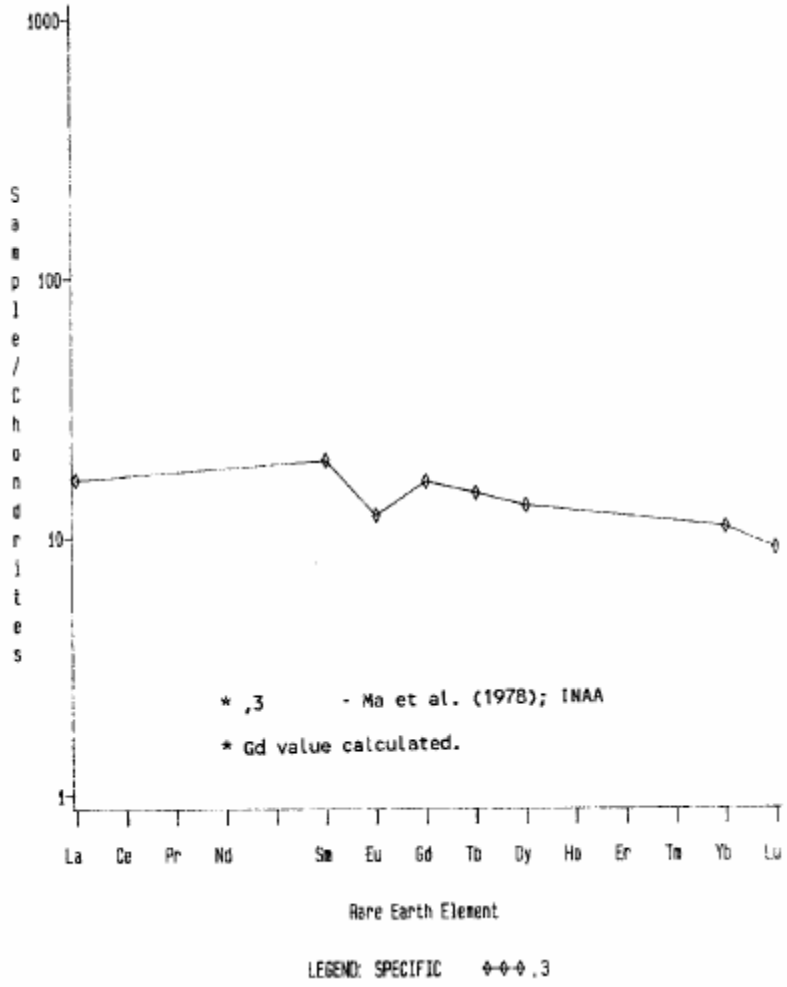

Figure 3. Rare earths in 15612.