15617 MEDIUM-GRAINED OLIVINE-NORMATIVE MARE BASALT ST. 9A 3.10 g

INTRODUCTION: 15617 is a medium-grained, olivine-bearing mare basalt which is very vesicular (Fig. 1). The olivine includes some microphenocrysts. In chemistry the sample appears to be a magnesian member of the Apollo 15 olivine-normative mare basalt group. It is tough with porphyritic olivine macroscopically visible. 15617 was collected as part of the rake sample at Station 9A.

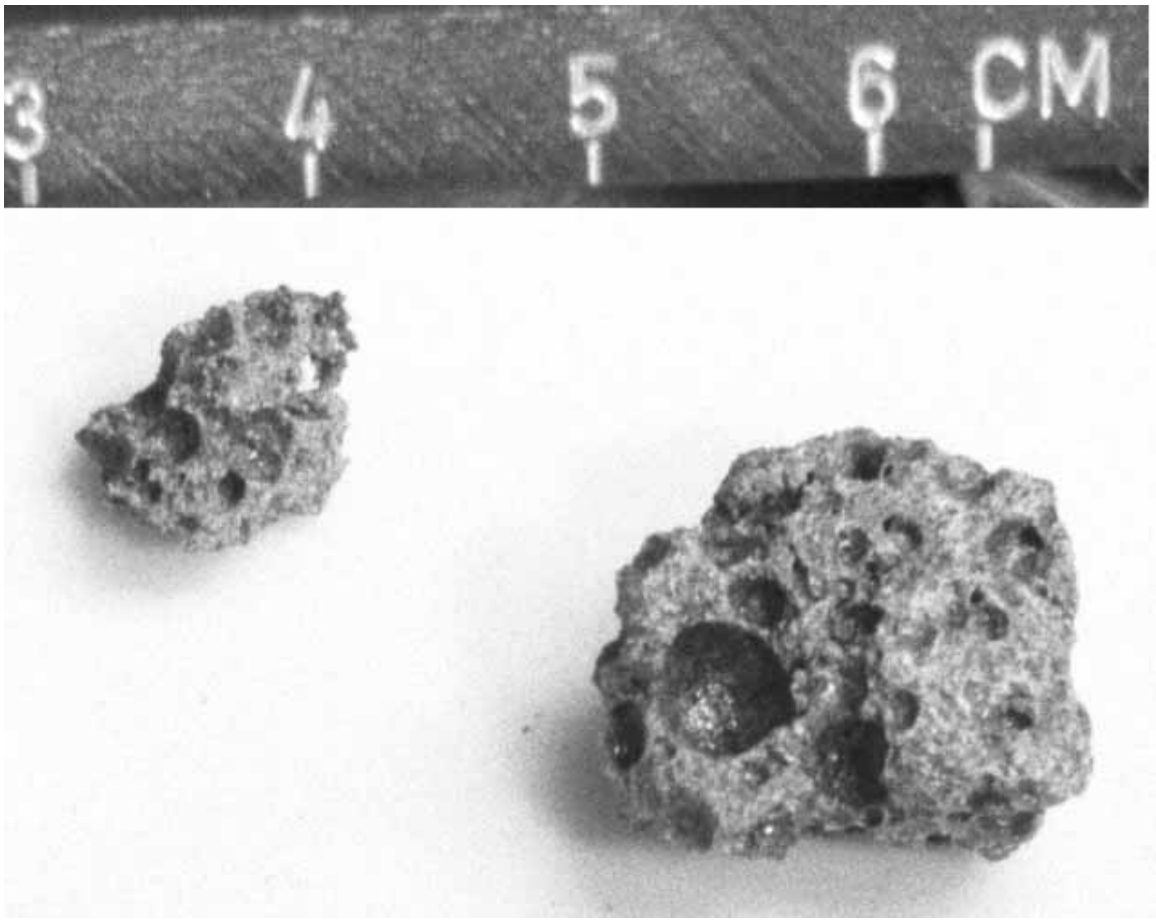

Figure 1. Post-original-chipping of 15617. S-71-56283

PETROLOGY: 15617 is an olivine-bearing, medium-grained, vesicular mare basalt (Fig. 2). Olivines are present as microphenocrysts, as small grains or inclusions in pyroxenes, and as small discrete grains. Some larger pyroxenes are twinned and zoned. Dowty et al. (1973b) described 15617 as an olivine-microgabbro "similar to 15613". They reported a mode of 56% pyroxene, 24% plagioclase, 11% olivine, 6% opaques, no silica, and 2% miscellaneous. They noted it to have subradiating intergrowths of elongated pyroxene

Fig. 2a

Fig. 2b

Figure 2. Photomicrographs of 15617,2.
Widths about 2 mm. a) transmitted light; b) crossed polarizers.

and plagioclase crystals. Microprobe analyses of pyroxene, olivine, plagioclase, Si-K glass, and Fe-metal were tabulated by Dowty et al. (1973c), and spinel group and ilmenite analyses were tabulated by Nehru et al. (1973). Nehru et al. (1974) included 15617 in their general discussion but gave no specific data or discussion. The mineral chemistry (Fig. 3) is typical of Apollo 15 olivine-normative mare basalts.

CHEMISTRY: A bulk rock analysis is listed in Table 1 and the rare earths are shown in Figure 4. A defocussed-beam microprobe analysis (Table 2) is consistent, and the low TiO_2 and high MgO suggest that this sample is an Mg-rich member of the Apollo 15 olivine-normative mare basalt group.

PROCESSING AND SUBDIVISIONS: A single chip ,1 was originally removed (Fig. 1) and partly used to make thin sections ,2 and ,6. In 1977, ,0 was re-chipped to produce ,3 which was used for chemical analysis and to make thin section ,7. During this operation, ,0 also split into two pieces; these two pieces have a total mass of 2.28 g.

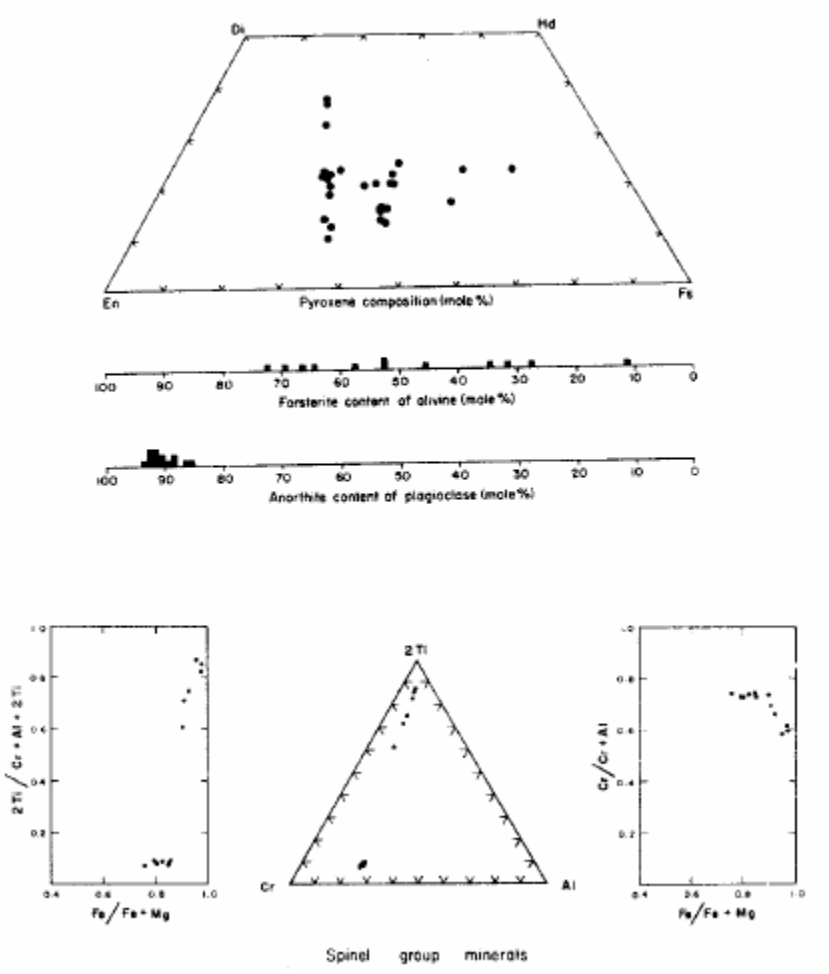

Figure 3. Chemistry of minerals in 15617 (Dowty et al., 1973b).

TABLE 15617-1. Defocussed beam bulk

		,3
Wt %	SiO2	
	TiO2	2.1
	Al2O3	8.8
	FeO	21.8
	MgO	12
	CaO	8.5
	Na2O	0.256
	K2O	0.041
	P2O5	
(ppm)	Sc	36
	V	208
	Cr	4945
	Mn	2080
	Co	49
	Ni	65
	Rb	
	Sr	
	Y	
	Zr	
	Nb	
	Hf	2.5
	Ba	70
	Th	
	U	
	Pb	
	La	5.2
	Ce	
	Pr	
	Nd	
	Sm	3.4
	Eu	0.80
	Gd	
	Tb	0.7
	Dy	4.4
	Ho	
	Er	
	Tm	
	Yb	2.1
	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	370
	W	
	Re	
	Os	
	Ir	
	Pt	
	Au	
	Hg	
	Tl	
	Bi	
		(1)

References and methods:

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

Notes:

(a) +25 ppm
(b) ±35 ppm

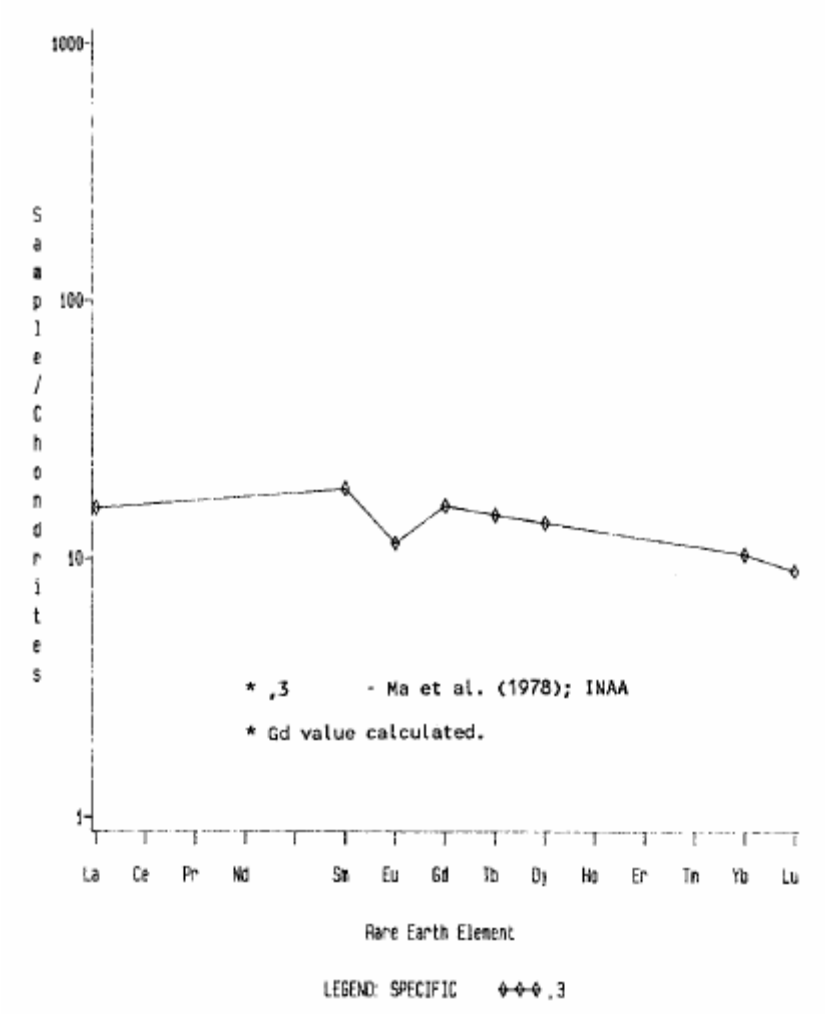

Figure 4. Rare earths in 15617.

Table 15617-2. Defocussed beam bulk analysis (Dowty et al., 1973a,b)

Wt %	SiO2	45.7
	TiO2	2.03
	Al2O3	8.0
	FeO	22.6
	MgO	11.8
	CaO	9.2
	Na2O	0.28
	K2O	0.01
ppm	Cr	2875
	Mn	1935