

15620 MEDIUM-GRAINED OLIVINE-NORMATIVE ST. 9A 6.60 g  
MARE BASALT

INTRODUCTION: 15620 is a medium-grained, olivine-bearing mare basalt which is very vesicular (Fig. 1). The yellow-green olivines are visible macroscopically but are rarely phenocrysts. In chemistry, the sample is a fairly average Apollo 15 olivine-normative mare basalt. It is tough. 15620 was collected as part of the rake sample at Station 9A.

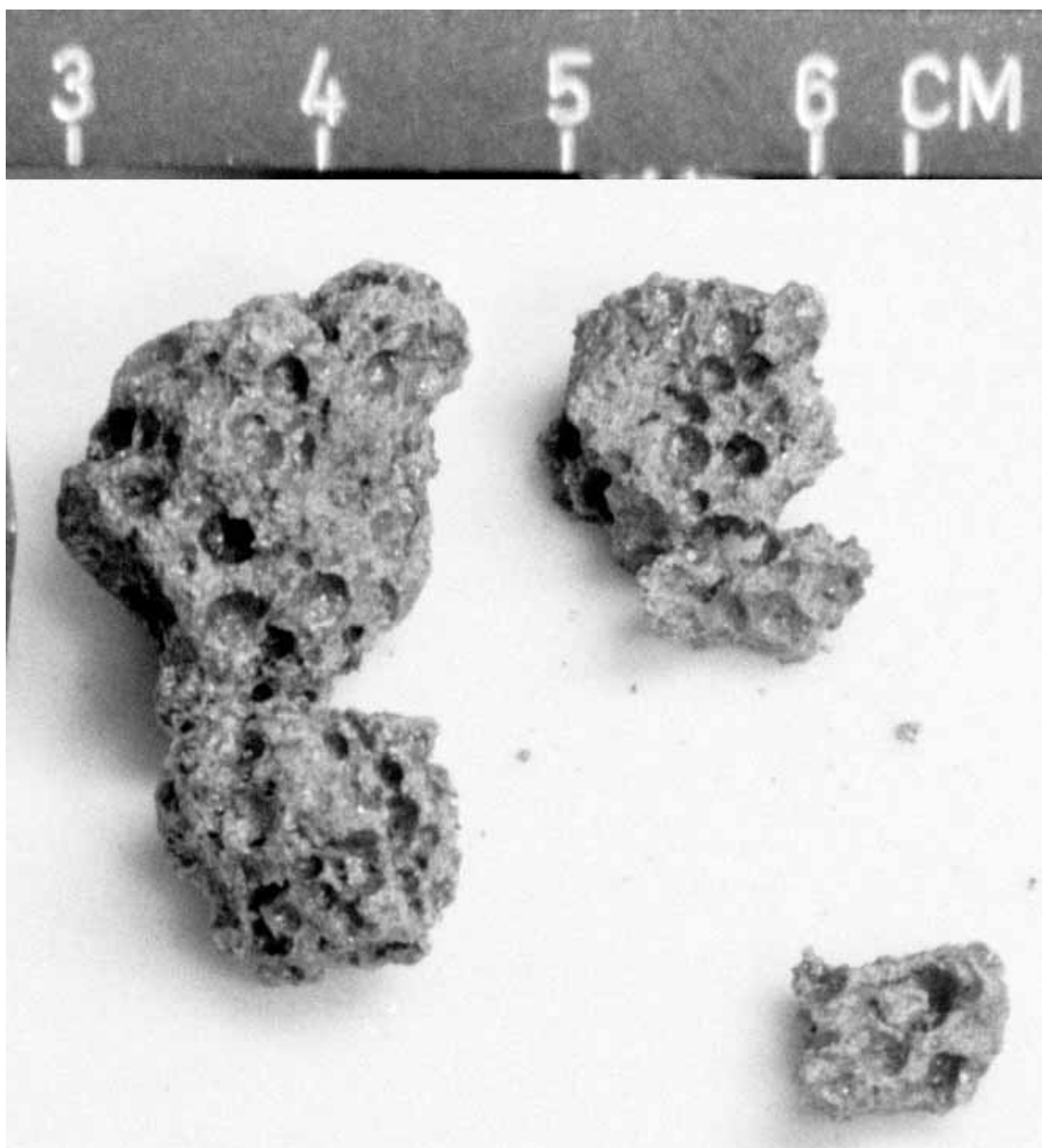
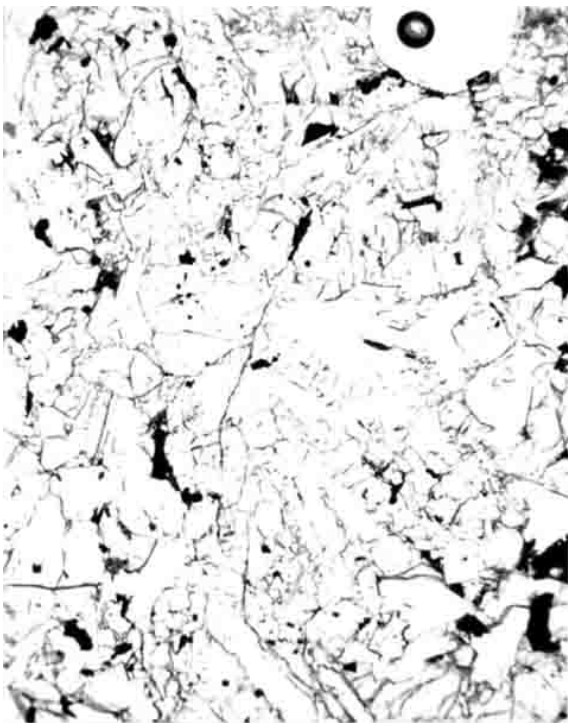


Figure 1. Post-chip view of 15620. S-71-56281

**PETROLOGY:** 15620 is a medium-grained, olivine-bearing, vesicular mare basalt (Fig. 2). The texture is gabbroic, with the olivines forming fairly small (less than 1 mm) anhedral crystals which only rarely are large enough to be considered phenocrystic. The pyroxenes, generally no more than 1 mm long, have mosaic extinction and the larger ones contain small olivine inclusions. Plagioclases are less than 1 mm long and either lathy or hollow, stubby cross-sections. Dowty et al. (1973c,b) reported a mode of 63% pyroxene, 24% plagioclase, 8% olivine, 4% opaque minerals, 0.2% silica (actually cristobalite) and 0.8% miscellaneous. Microprobe analyses of pyroxene, plagioclase, olivine, 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). 15620 was included in the general discussion of Nehru et al. (1974) but no specific data or discussion were presented. The metal grains generally contain 1.3 to 1.8% Co and 4.9 to 6.8% Ni, but grains contain up to 4.2% Co and 28% Ni. The ilmenite contains 0.11 to 1.03% MgO. The mineral chemistry (Fig. 3) is typical of the Apollo 15 olivine-normative mare basalts.



**Fig. 2a**



**Fig. 2b**

Figure 2. Photomicrographs of 15620,3.  
Widths about 3 mm. a) transmitted light; b) crossed polarizers.

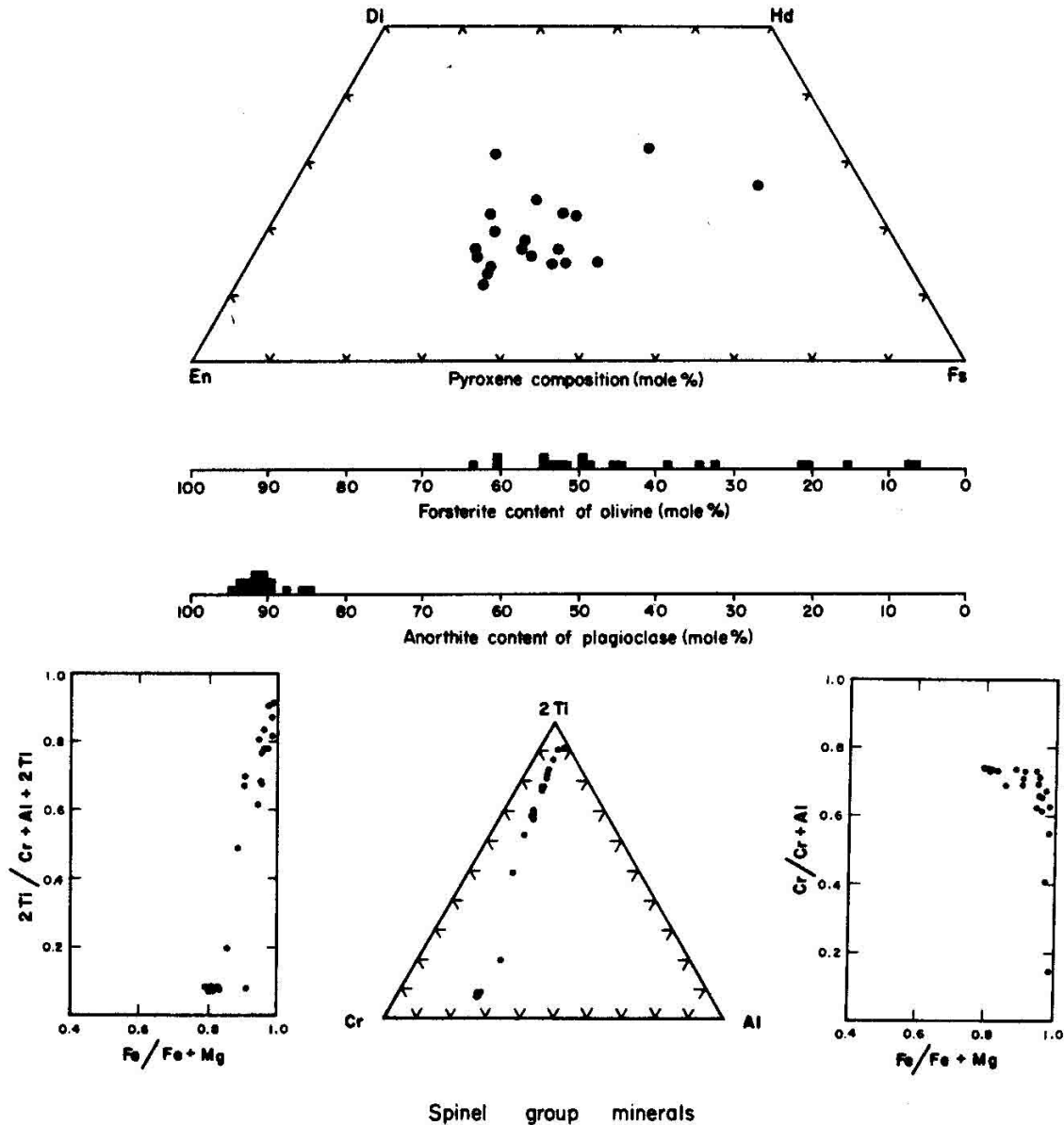


Figure 3. Chemistry of minerals in 15620 (Dowty et al., 1973b).

**CHEMISTRY:** A bulk rock analysis is listed in Table 1 and the rare earths shown in Figure 4. A defocused beam microprobe analysis (Table 2) is generally consistent. The analyses show that 15620 is an average to slightly Mg-enriched Apollo 15 olivine-normative mare basalt.

**PROCESSING AND SUBDIVISIONS:** 15620 was chipped up (Fig. 1), with ,1 being potted and partly used to make thin sections ,3 ,10; and ,11. In 1975 the two chips constituting ,0 were numbered separately as ,14 and ,15 and small chips were taken from ,2 for chemical analysis. ,14 and ,15 have masses of 3.23 g and 1.56 g respectively.

TABLE 15620-1. Bulk rock chemical analysis

		.9
wt%	SiO <sub>2</sub>	
	TiO <sub>2</sub>	2.3
	Al <sub>2</sub> O <sub>3</sub>	8.8
	FeO	23.5
	MgO	11.1
	CaO	8.9
	Na <sub>2</sub> O	0.259
	K <sub>2</sub> O	0.044
	P <sub>2</sub> O <sub>5</sub>	
(ppm)	Sc	41
	V	225
	Cr	4420
	Mn	2000
	Co	48
	Ni	95
	Rb	
	Sr	
	Y	
	Zr	
	Nb	
	Hf	2.7
	Ba	54(a)
	Th	
	U	
	Pb	
	La	5.4
	Ce	
	Pr	
	Nd	
	Sm	3.4
	Eu	0.88
	Gd	
	Tb	0.69
	Dy	4.4
	Ho	
	Er	
	Tm	
Yb	2.1	
Lu	0.36	
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	440
	W	
	Re	
	Os	
	Ir	
	Pt	
Au		
Hg		
Tl		
Pb		

(1)

References and methods:

(1) Ma et al. (1976); INAA

Notes:

(a)  $\pm 15$  ppm

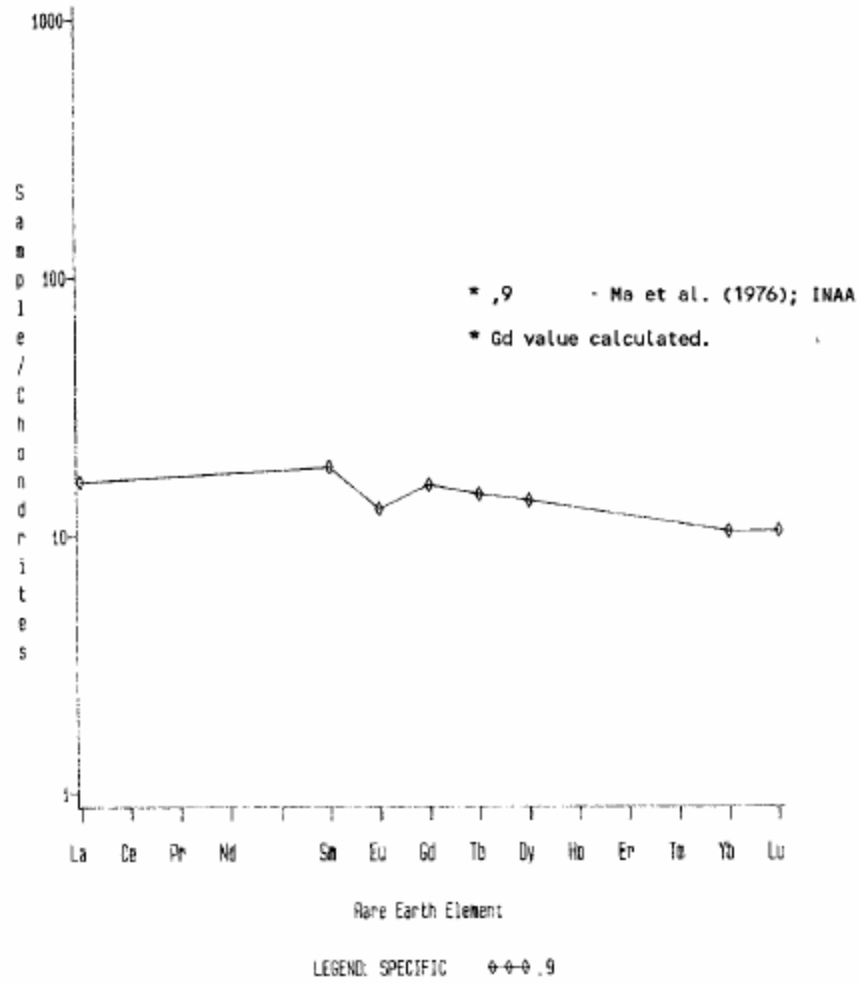


Figure 4. Rare earths in 15620.

TABLE 15620-2. Defocussed beam bulk analysis (Dowty et al., 1973a,b)

Wt%	SiO <sub>2</sub>	44.9
	TiO <sub>2</sub>	2.63
	Al <sub>2</sub> O <sub>3</sub>	9.7
	FeO	21.9
	MgO	10.9
	CaO	9.6
	Na <sub>2</sub> O	0.36
	K <sub>2</sub> O	0.04
	P <sub>2</sub> O <sub>5</sub>	0.13
ppm	Cr	2740
	Mn	2170