

15661 FINE-GRAINED OLIVINE-NORMATIVE ST. 9A 5.90 g
MARE BASALT

INTRODUCTION: 15661 is a fine- to medium-grained olivine-bearing mare basalt which is vesicular and vuggy (Fig. 1). Small olivines are visible macroscopically. In chemistry, the sample is an average member of the Apollo 15 olivine-normative mare basalt group. The sample is rather rounded. 15661 was collected as part of the rake sample from Station 9A.

PETROLOGY: 15661 is a fine- to medium-grained microgabbroic mare basalt (Fig. 2) with about 60% pyroxene. Rare olivine phenocrysts reach about 1.5 mm, are anhedral, and contain crystallized silicate melt inclusions. Most pyroxenes, plagioclases, and olivines are less than 0.5 mm across. The pyroxenes and olivines tend to be granular and the plagioclases to be hollow laths which are not euhedral. A few variolitic areas are present. Chromite forms cores to some ulvospinel, cristobalite, (sieved) fayalite, ilmenite, sulfide, and some glass are present. Steele et al. (1972a) showed Ti/Al ratios for pyroxenes ranging from 1/2 to 1/4. They also reported plagioclases of An₉₂₋₈₇, containing 0.5 to 0.65% Fe, similar to Apollo 12 and other Apollo 15 mare basalt plagioclases.

CHEMISTRY: Ma et al. (1978) reported a bulk rock analysis (Table 1; Fig 3). The composition is rather average for Apollo 15 olivine-normative mare basalts. The MgO is an imprecisely determined abundance.

PROCESSING AND SUBDIVISIONS: 15661 was sawn to produce pieces ,1 (several small pieces) and ,2 (one piece) from its "S" end. ,2 was partly used to make thin sections ,6 to ,8. In 1979, the north end was chipped to produce interior, and saw-blade free, pieces (,9; ,10). ,10 was used for chemical and petrographic studies, including the making of thin section ,13. ,0 is now 3.21 g.

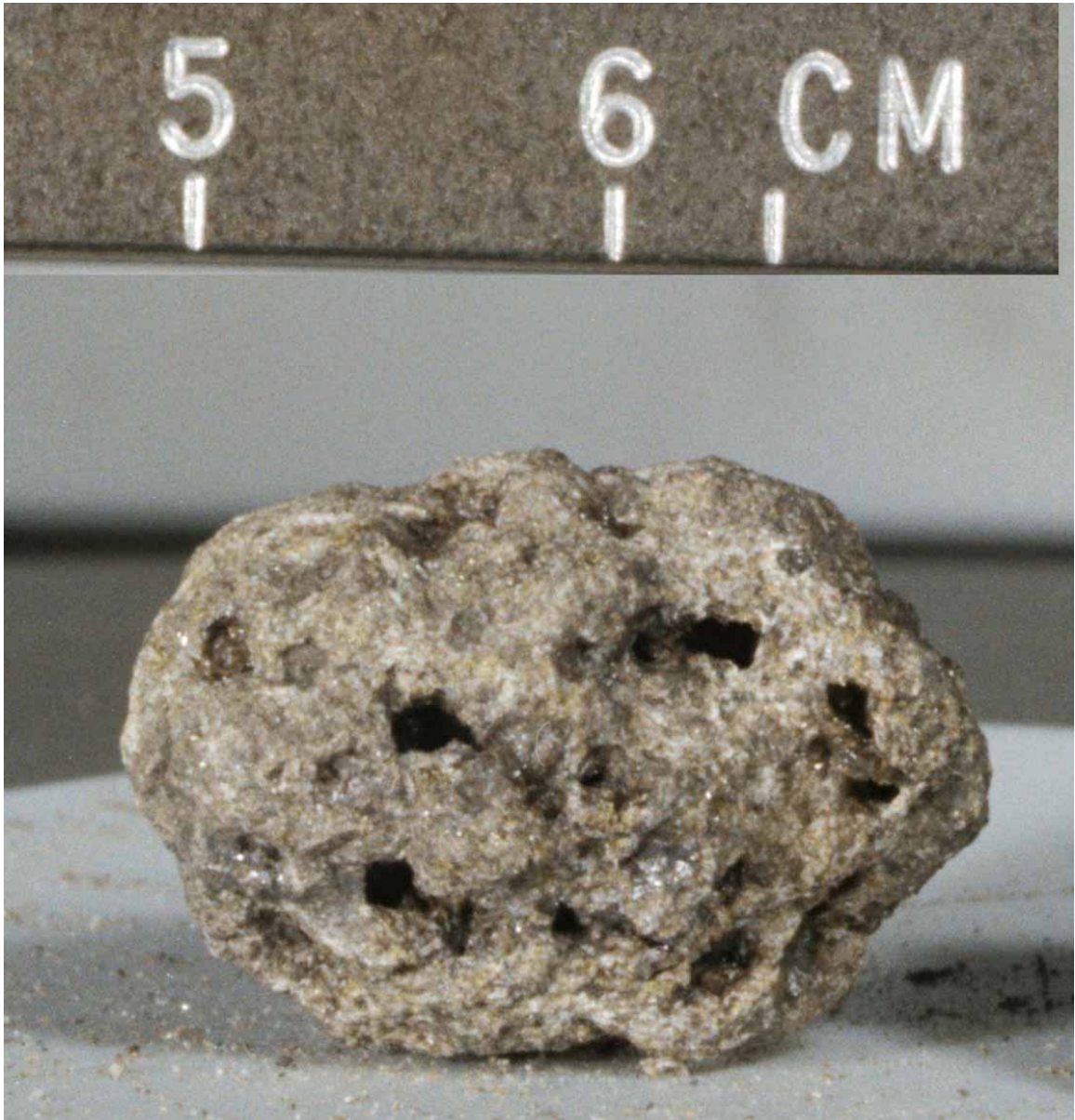


Figure 1. Pre-saw view of 15661. S-71-49530



Fig. 2a



Fig. 2b

Figure 2. Photomicrographs of 15661,7.
Widths about 3 mm. a) transmitted light; b) crossed polarizers.

TABLE 15661-1. Bulk rock chemical analysis

		.10
wt %	SiO ₂	
	TiO ₂	1.9
	Al ₂ O ₃	8.7
	FeO	21.9
	MgO	12
	CaO	8.6
	Na ₂ O	0.250
	K ₂ O	0.036
(ppm)	P ₂ O ₅	
	Sc	35
	V	186
	Cr	4470
	Mn	1990
	Co	51
	Ni	80(a)
	Rb	
	Sr	
	Y	
	Zr	
	Nb	
	Hf	2.5
	Ba	70(b)
	Th	
	U	
	Pb	
	La	5.1
	Ce	
	Pr	
	Nd	
	Sm	3.3
	Eu	0.78
	Gd	
	Tb	0.7
	Dy	4.3
	Ho	
	Er	
Tm		
Yb	2.0	
Lu	0.25	
Li		
Be		
B		
C		
N		
S		
F		
Cl		
Br		
Cu		
Zn		
(ppt)	I	
	At	
	Ga	
	Ge	
	As	
	Se	
	Mp	
	Tc	
	Ru	
	Rh	
	Pd	
	Ag	
	Cd	
	In	
	Sn	
	Sb	
	Te	
	Cs	
	Ta	410
	W	
	Re	
	Os	
	Ir	
	Pt	
	Au	
	Hg	
	Tl	
	Pb	

References and methods:

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

Notes:

(a) +25 ppm
 (b) +40 ppm

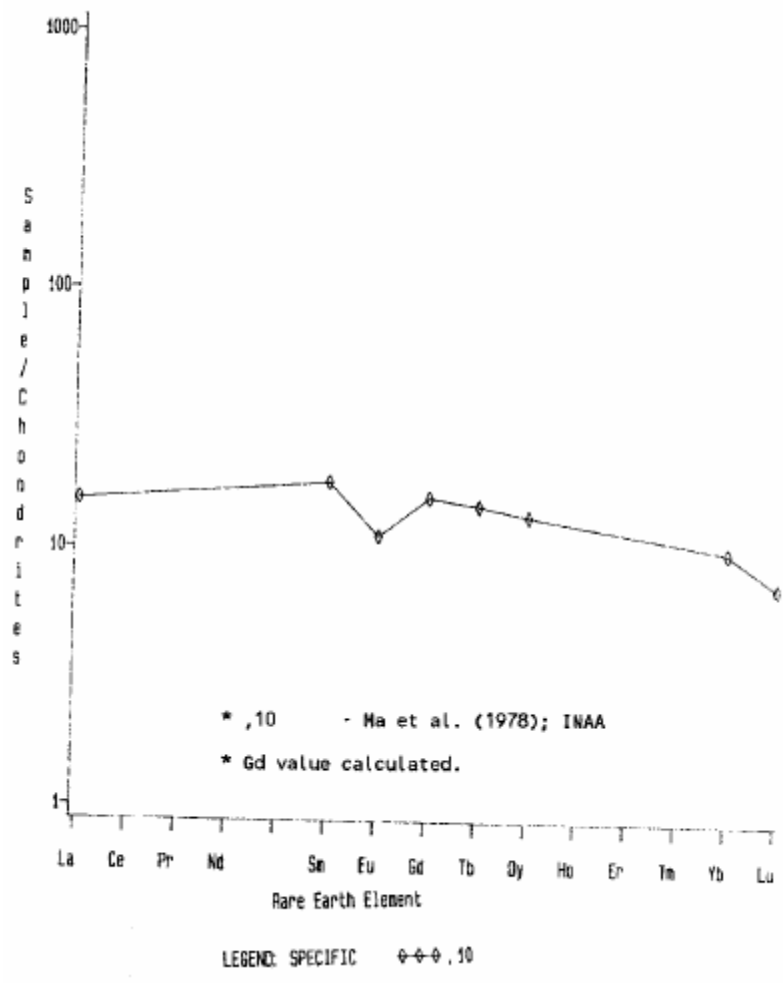


Figure 3. Rare earths in 15661.