

15674 FINE-GRAINED OLIVINE-NORMATIVE ST. 9A 35.7 g
MARE BASALT

INTRODUCTION: 15674 is a fine-grained, olivine-bearing mare basalt (Fig. 1). The olivines form small phenocrysts. In chemistry, the basalt appears to be an average member of the olivine-normative mare basalt group. It is tough, with angular corners. One side has abundant 1 mm-sized zap pits and indicates a "simple", single-orientation surface history. The sample is slightly vuggy. It was collected as part of the rake sample at Station 9A.

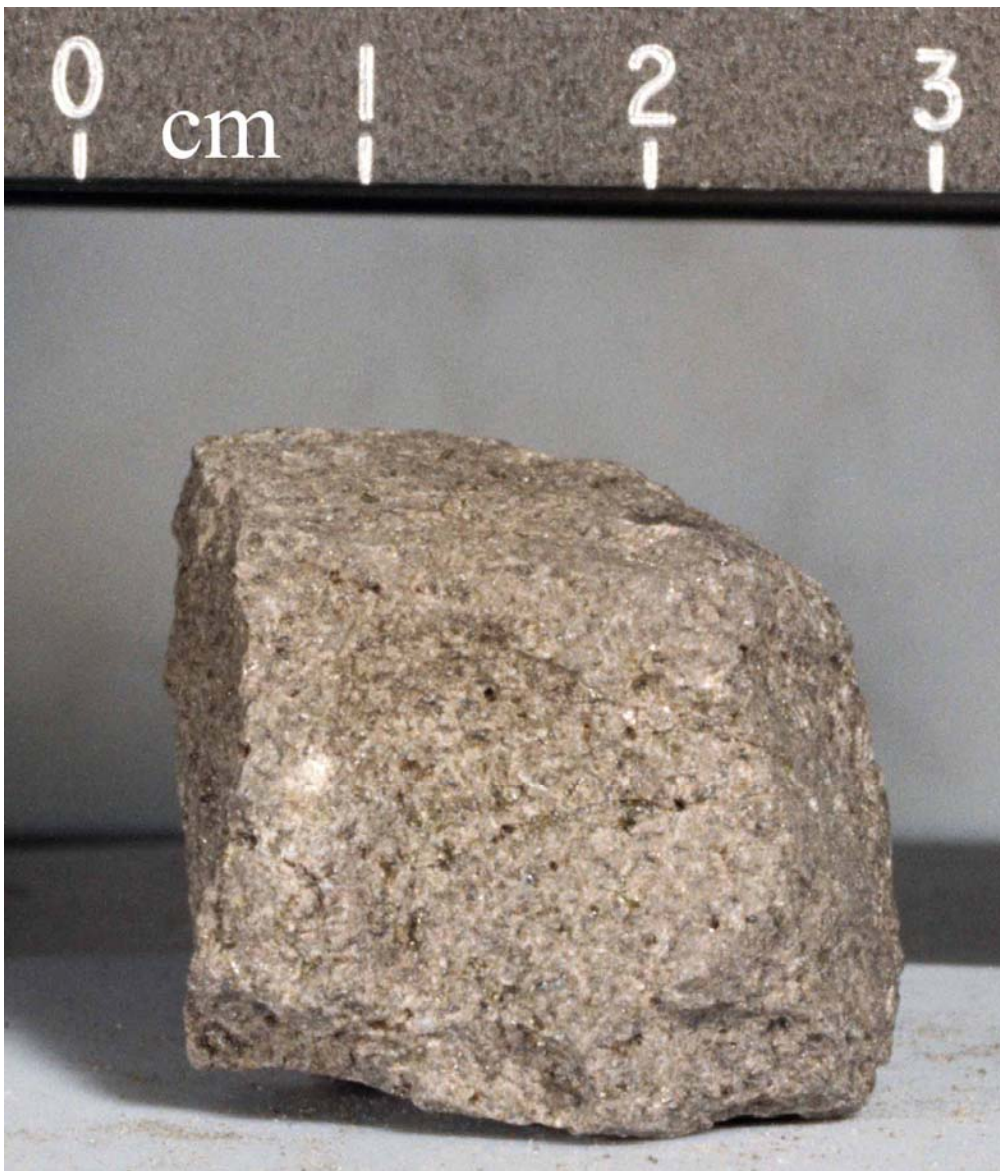


Figure 1. Pre-chip view of 15674. S-71-49834

PETROLOGY: 15674 has a fine-grained groundmass of granular pyroxene with some olivine, and raggedy plagioclases, and a few anhedral olivine phenocrysts (Fig. 2). The granular mafic grains tend to cluster with each other and with opaque minerals. In places the plagioclase grows radially.

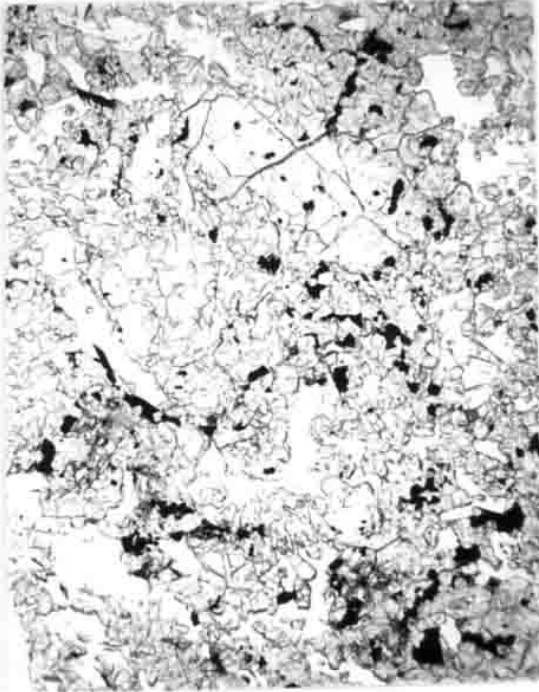


Fig. 2a

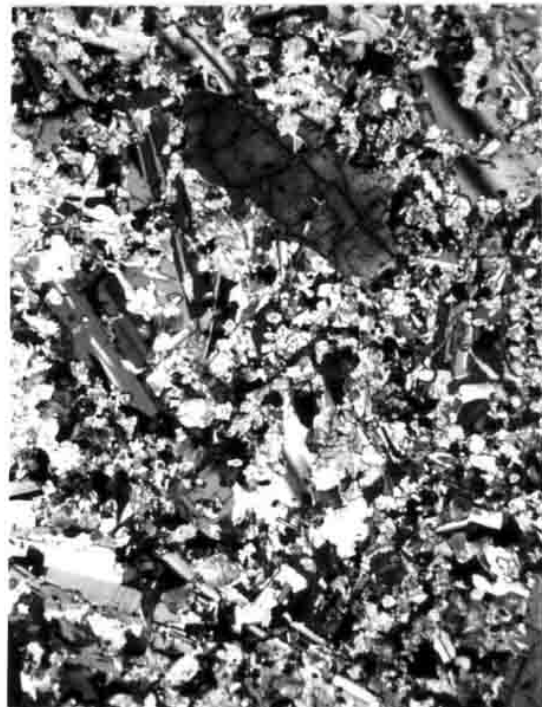


Fig. 2b

Figure 2. Photomicrographs of 15674,5. Widths about 3 mm.
a) transmitted light; b) crossed polarizers.

CHEMISTRY: Chemical analyses are listed in Table 1, with rare earths shown in Figure 3. The analyses agree only moderately well. The composition is of an average-to-slightly-more-fractionated-than-average Apollo 15 olivine-normative basalt. Compston et al. (1972) noted the systematic lower abundances of their Rb analyses made by XRF (reported in Chappell and Green, 1973) as compared with the more reliable ID/MS data. Chappell and Green (1973) found the composition to be so similar to those of 15658 and 15668 that they suggested they were all broken pieces of the same rock. However, 15658 is a much coarser-grained olivine basalt, and 15668 is a much finer-grained olivine basalt, precluding this suggestion.

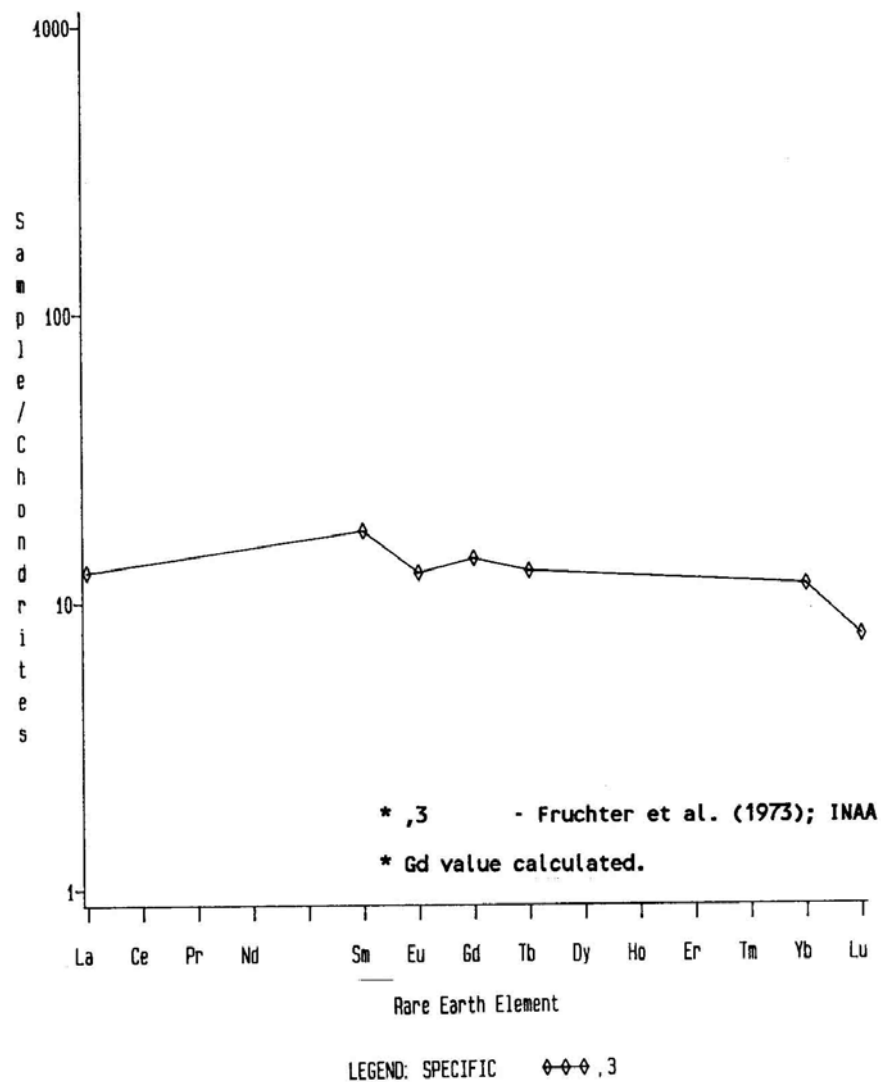


Figure 3. Rare earths in 15674.

TABLE 15674-1. Bulk rock chemical analyses

	,4(,11)	,4(,11)	,3
Wt %			
SiO ₂	45.04		
TiO ₂	2.58		2.91
Al ₂ O ₃	8.95		8.11
FeO	22.78		21.54
MgO	9.36		
CaO	10.15		
Na ₂ O	0.28		0.26
K ₂ O	0.05		
P ₂ O ₅	0.08		
(ppm)			
Sc			42
V			
Cr	3220		3940
Mn	2400		
Co			52
Ni			
Rb	0.65	0.80	
Sr	100.9	100.3	
Y	24		
Zr	89		
Nb	7		
Hf			2.2
Ba			
Th			
U			
Pb			
La			4.2
Ce			
Pr			
Nd			
Sm			3.2
Eu			0.87
Gd			
Tb			0.6
Dy			
Ho			
Er			
Tm			
Yb			2.3
Lu			0.26
Li			
Be			
B			
C			
N			
S	600		
F			
Cl			
Br			
Cu			
Zn			
(ppb)			
I			
At			
Ga	3100		
Ge			
As			
Se			
Mo			
Tc			
Ru			
Rh			
Pd			
Ag			
Cd			
In			
Sn			
Sb			
Te			
Cs			
Ta			470
W			
Re			
Os			
Ir			
Pt			
Au			
Hg			
Tl			
Bi			
	(1)	(2)	(3)

References and methods:

- (1) Chappell and Green (1973), Compston *et al.* (1972); XRF
- (2) Compston *et al.* (1972); ID/MS
- (3) Fruchter *et al.* (1973); INAA

RADIOGENIC ISOTOPES: Compston et al. (1972) reported Rb-Sr isotopic data (Table 2). For a 3.3 b.y. age, the data give an initial $^{87}\text{Sr}/^{86}\text{Sr}$ ratio of 0.69950, indistinguishable from that of other Apollo 15 mare basalts.

PROCESSING AND SUBDIVISIONS: A piece was chipped off and it was further chipped to produce material for allocations. ,0 is now 28.91 g. The only thin section, ,5, was made from ,2.

TABLE 15674-2. Rb-Sr isotopic data
(Compston et al., 1972)

Rb ppm	Sr ppm	$^{87}\text{Rb}/^{86}\text{Sr}$	$^{87}\text{Sr}/^{86}\text{Sr}$	T_{BABI}
0.80 (ID)	100.3 (ID)	0.0231	0.70059 ± 10	4.56 b.y.
0.65 (XRF)	100.9 (XRF)	--	0.70056 ± 10 (a)	--

(a) unspiked