

15117 PORPHYRITIC SUBOPHITIC QUARTZ-NORMATIVE ST. 2 23.3 g
MARE BASALT

INTRODUCTION: 15117 is a coarse, pyroxene-phyric mare basalt (Fig. 1) belonging to the quartz-normative group. The phenocrysts are yellow-green and conspicuous. The sample has been dated as 3.35 ± 0.04 b.y. old. The sample is tough, has a few vugs, and lacks zap pits. It was collected as part of the rake sample 5 m east of the boulder at Station 2 (see Figure 15105-2).



Figure 1. Pre-split view of 15115. S-71-48768

PETROLOGY: 15117 is a coarse basalt rather similar to 15115 and 15116. The pyroxene phenocrysts are zoned and in some cases twinned (Fig. 2). Plagioclases are irregular laths. Steele et al. (1972a) noted that the thin section lacked olivine; Papanastassiou and Wasserburg (1973) referred to it as a friable coarse basalt or gabbro containing ilmenite.

CHEMISTRY: Two analyses are listed in Table 1, with rare earths plotted in Figure 3. The major elements agree well, and are typical quartz-normative mare basalt abundances. The rare-earth abundances of Fruchter et al. (1973) conform closely with typical quartz-normative basalt abundances, but those of Cuttitta et al. (1973) are much higher and their Cr abundance is low. This is possibly a sampling problem due to the coarse grain size of the sample, but the rare earth data of Cuttitta et al. (1973) are generally higher than those of other groups on the same rocks, indicating a systematic error.

RADIOGENIC ISOTOPES AND GEOCHRONOLOGY: Papanastassiou and Wasserburg (1973) determined a Rb-Sr two-point isochron from plagioclase and "ilmenite" separates (Table 2). The age of 3.35 ± 0.04 and initial $^{87}\text{Sr}/^{86}\text{Sr}$ of 0.69928 ± 5 are identical with those of other Apollo 15 mare basalts.

PROCESSING AND SUBDIVISIONS: Several pieces were chipped from ,0 which is now 16.79 g. Two thin sections (,2 and ,9) were made from parts of ,2.



Figure 2. Photomicrograph of thin section 15117,2.
Crossed polarizers. Width about 1.25 mm.

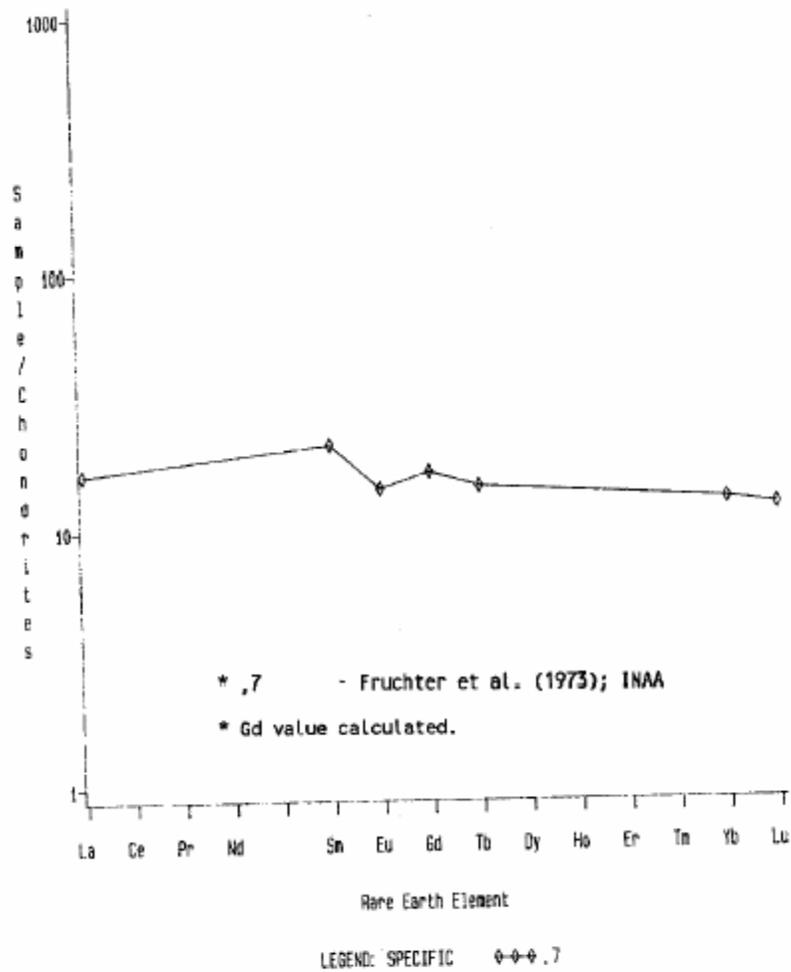


Figure 3. Rare earths in 15117.

TABLE 15117-2. Rb-Sr isotopic data
(Papanastassiou and Wasserburg, 1973)

Separate	Separation	Weight mg	^{87}Rb 10^{-8} m/g	^{86}Sr 10^{-8} m/g	$^{87}\text{Rb}/^{86}\text{Sr}$ $\times 10^2$	$^{87}\text{Sr}/^{86}\text{Sr}$
Plagioclase	Mechanical	6.9	0.183	289.3	0.148+2	0.69935+5
"Ilmenite"	Density	6.2	2.029	31.70	14.93+6	0.70639+7

TABLE 15117-1. Chemical analyses

		,8	,7
wt %	SiO2	47.80	
	TiO2	2.09	2.02
	Al2O3	9.89	8.78
	FeO	20.41	21.0
	MgO	8.02	
	CaO	10.98	
	Na2O	0.33	0.308
	K2O	0.07	
	P2O5	0.11	
	(ppm)	Sc	43
V		188	
Cr		1920	4450
Mn		2250	
Co		38	53
Ni		30	
Rb		1.0	
Sr		150	
Y		26	
Zr		90	
Nb		<10	
Hf			2.5
Ba		100	
Th			
U			
Pb			
La		12	5.5
Ce			
Pr			
Nd			
Sm			3.9
Eu			1.01
Gd			
Tb			0.7
Dy			
Ho			
Er			
Tm			
Yb	4.3	2.6	
Lu		0.42	
Li	5.2		
Be	1.4		
(ppb)	B		
	C		
	N		
	S		
	F		
	Cl		
	Br		
	Cu	12	
	Zn		
	I		
	Ac		
	Ga	3800	
	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)	(2)	

References and methods:
 (1) Christian et al. (1972),
 Ottitta et al. (1973); Chem,
 XRF, opt. emission spec.
 (2) Fruchter et al. (1973); INAA