

15105 FINE-GRAINED OLIVINE-NORMATIVE MARE BASALT ST. 2 5.6 g

INTRODUCTION: 15105 is an olivine-phyric mare basalt. It is vesicular (Fig. 1) with fine-grained microphenocrystic olivine and brown pyroxene visible macroscopically. 15105 was taken from the regolith sample collected with the rake sample 5 m east of the boulder at Station 2 (Fig. 2).



Figure 1. Post-chipping view of 15105. The front chip ,2 was potted and thin section ,6 made from it. S-72-20376

PETROLOGY: 15105 is a member of the olivine-normative mare basalt group. It is fine-to medium-grained (Fig. 2) with irregular small olivine phenocrysts. It was described by Dowty et al. (1973a,b), and microprobe analyses were tabulated of silicate minerals and metals by Dowty et al. (1973c) (Fig: 4). Nehru et al. (1973, 1974) provided spinel group and ilmenite microprobe analyses. The sample consists of 63% pyroxene,

24% plagioclase, 8% opaque minerals, 4% olivine, 0.4% silica, and 0.6% others. The olivine phenocrysts are up to about 2 mm across, but most are much smaller; they contain silicate melt inclusions and euhedral spinels. They are embayed and reacted and cusps enclose matrix pyroxene and plagioclase. Scarce euhedral pyroxene phenocrysts are present. The groundmass is a fairly uniform intergrowth of granular to lathy pyroxenes and irregular plagioclase laths which are partly poikilitic. According to Dowty et al. (1973a,b), ilmenites are large and irregular while chromite is fairly scarce and generally forms cores to ulvospinel. A rare metal phase contains 1.5 to 2.3% Co and 4.4 to 8.2% Ni. A K-rich phase is also present.

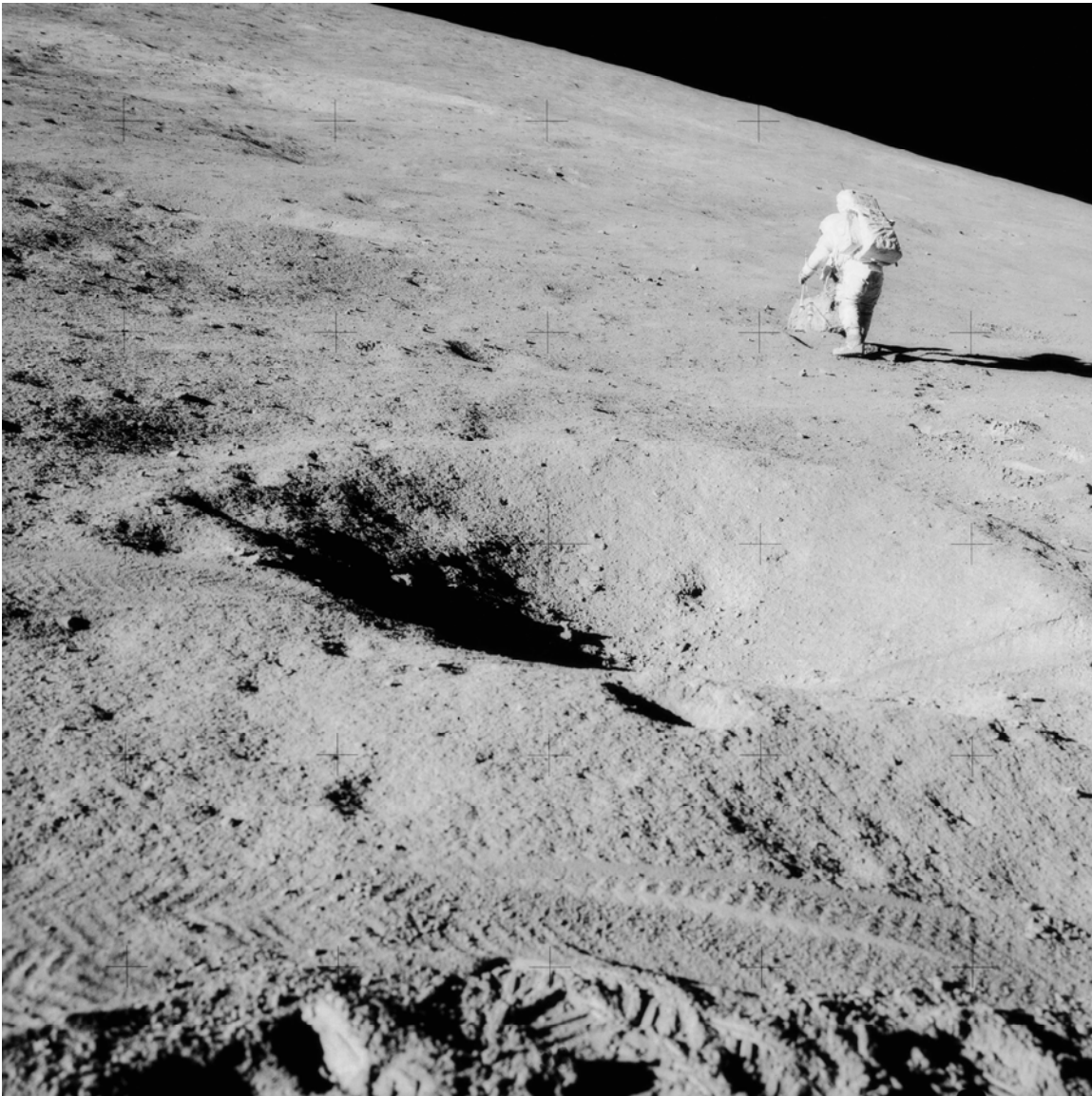


Figure 2. Sample locations for most Station 2 rocks (AS-15-85-11435). Looped area is rake area, samples 15100-15148. Boulder by astronaut was sampled as 15205 and 15206.

CHEMISTRY: A defocussed beam microprobe analysis by Dowty et al. (1973a,b) (Table 1) agrees fairly well with the INAA analysis of Ma et al. (1976) (Table 2). Rare earths are shown in Figure 5. The analyses conform with those for evolved members of the olivine-normative mare basalt group.

PROCESSING AND SUBDIVISIONS: A few small chips were taken from ,0 (now 3.48 g) and all subdivisions made from them (Fig. 1). These chips ,(1) now are 1.34 g. Two thin sections ,5 and ,6 were made from separate chips.



Figure 3. Photomicrograph of 15105,6.
Crossed polarizers. Width about 1.25 mm

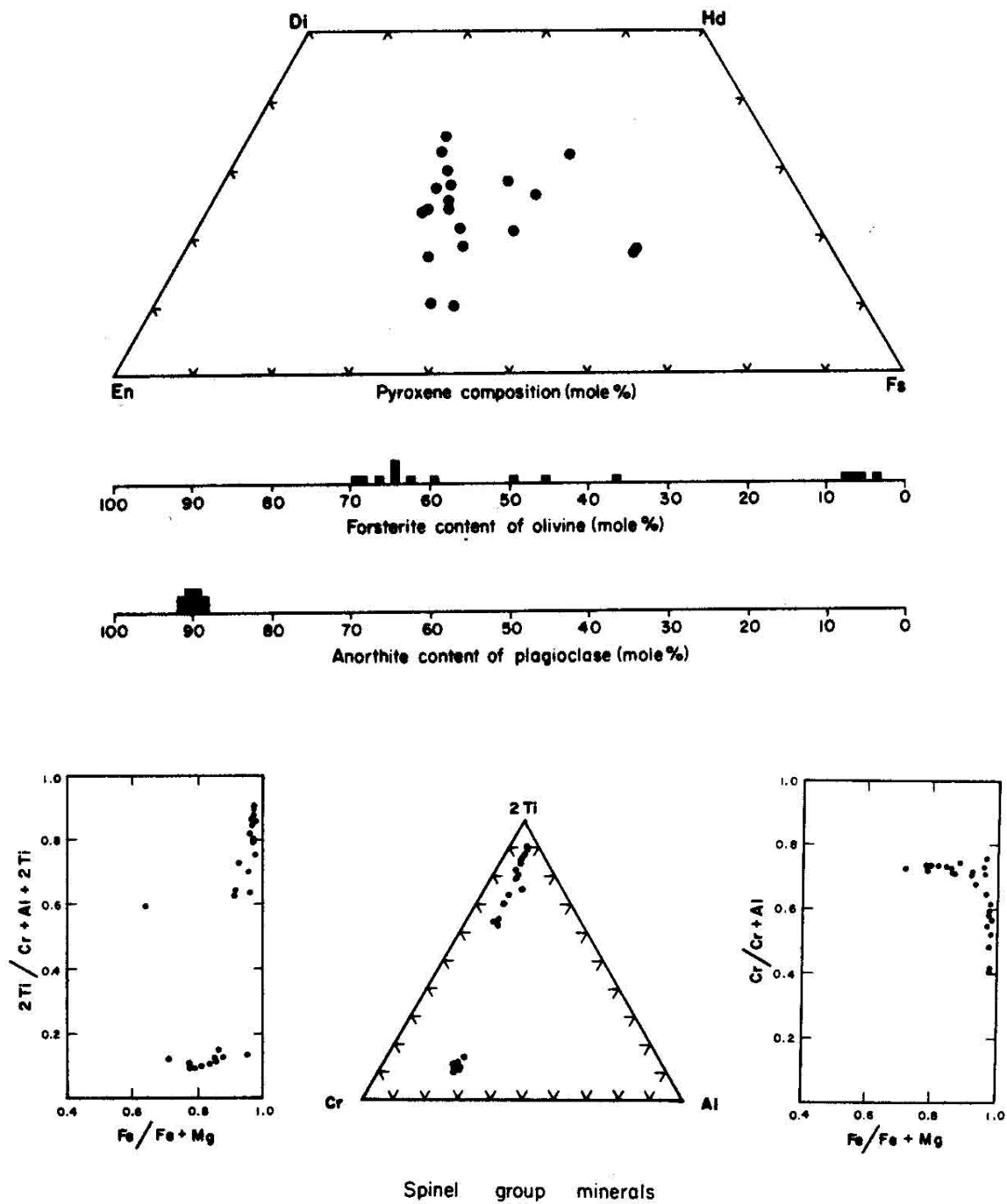


Figure 4. Silicate and opaque mineral analyses (Dowty et al., 1973b).

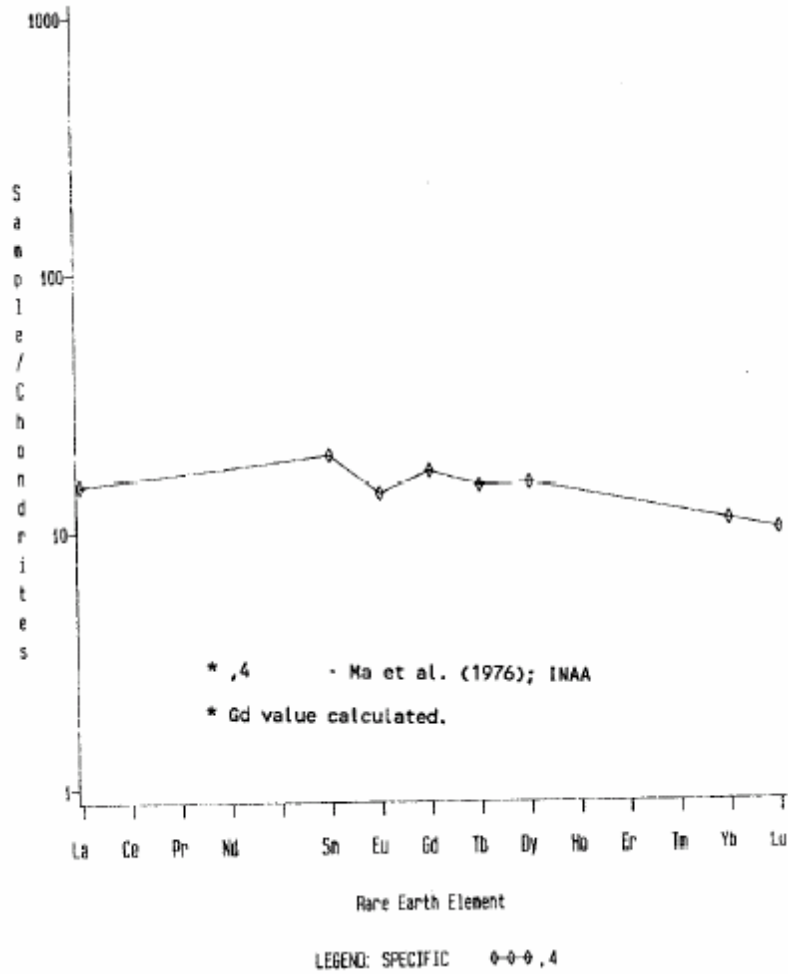


Figure 5. Rare earths.

Table 15105-1. Microprobe defocussed beam analysis (Dowty et al., 1973a, b)

Wt %	SiO ₂	46.0
	TiO ₂	2.97
	Al ₂ O ₃	8.2
	FeO	22.7
	MgO	9.0
	CaO	10.2
	Na ₂ O	0.33
	K ₂ O	0.03
	P ₂ O ₅	0.09
	ppm	Cr
Mn		2015

TABLE 15105-2. Chemical analysis

		.4
Wt %	SiO ₂	
	TiO ₂	3.0
	Al ₂ O ₃	8.5
	FeO	21.8
	MgO	9.3
	CaO	8.9
	Na ₂ O	0.358
	K ₂ O	0.047
	P ₂ O ₅	
(ppm)	Sc	42
	V	204
	Cr	4040
	Mn	2210
	Co	44
	Ni	466
	Rb	
	Sr	
	Y	
	Zr	
	Nb	
	Hf	3.1
	Ba	80(a)
	Th	
	U	
	Pb	
	La	5.0
	Ce	
	Pr	
	Nd	
	Sm	3.6
	Eu	0.97
	Gd	
	Tb	0.71
	Dy	4.9
	Ho	
	Er	
	Tm	
	Yb	2.2
	Lu	0.34
	Li	
	Be	
	B	
	C	
	N	
	S	
	F	
	Cl	
	Br	
	Cu	
	Zn	
(ppb)	I	
	At	
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	Mo	
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	Pd	
	Ag	
	Cd	
	In	
	Sn	
	Sb	
	Te	
	Cs	
	Ta	4500
	W	
	Re	
	Os	
	Ir	
	Pt	
	Au	
	Hg	
	Tl	
	Pb	
	Bi	
		(1)

References and methods:

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

Notes

(a) +35 ppm