60666 GLASSY IMPACT MELT, CLAST OF BASALTIC IMPACT MELT 15.95 g

INTRODUCTION: 60666 is a dark gray, coherent, glassy to fine-grained impact melt with many clasts and vesicles and adhering dust. A large fragment of lighter colored basaltic impact melt dominates the interior of the rock (Fig. 1). It is a rake sample collected about 70 m west southwest of the Lunar Module. Zap pits are rare.

FIGURE 1. Smallest scale division in mm. S-73-20468.

PETROLOGY: Dowty et al. (1974b) and Warner et al. (1976b) provide petrographic description of the large basaltic clast. Xenocrysts of shocked plagioclase and olivine rest in a matrix of skeletal to feathery olivine and glassy to finely crystalline mesostasis (Fig. 2). Rare, very small needles of plagioclase occur interstitial to the matrix olivines. A few grains of spinel appear to have grown from the melt. The skeletal olivines are zoned (ranging from Fo_{87-96}) suggesting rapid growth from the melt. Plagioclase needles and

xenocrysts are the same composition (Fig. 3). Intergrowths of Fe-metal (4-21% Ni, 0.4-1.3% Co), schreibersite and troilite and a few discrete grains of chromite are also present. Mineral analyses are tabulated by Dowty et al. (1976).

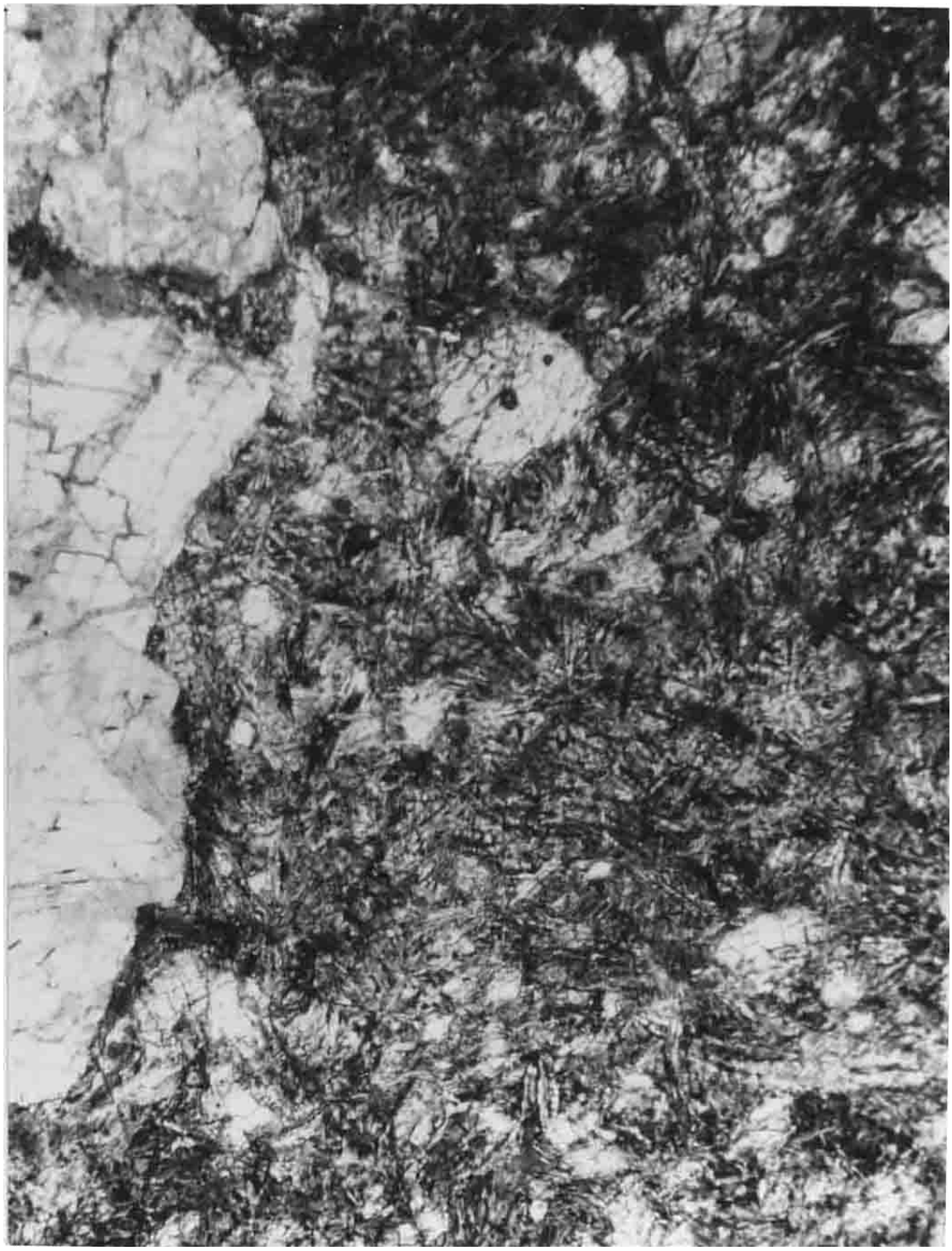

FIGURE 2. 60666,2. General view, partly xpl. Width 2 mm.

CHEMISTRY: Major and trace element data on the dark, glassy melt are presented by Wasson et al. (1977). Dowty et al. (1974b) give major elements of the lighter colored, basaltic clast and of the melt portion only of this clast (excluding xenocrysts) by DBA. The bulk DBA analysis of the basalt clast is reproduced by Warner et al. (1976b).

The two bulk analyses show that the basalt clast and the dark, glassy melt are not the same composition (Table 1). The dark, glassy material analyzed by Wasson et al. (1977) is very similar to the local mature soils. A significant meteoritic component is indicated by the siderophile data. The basaltic clast analyzed by Dowty et al. (1974b) is much less aluminous and has a higher Mg/Fe than the dark, glassy material (Table 1).

PROCESSING AND SUBDIVISIONS: In 1972 several chips were removed from the rock and a portion of the basaltic clast (,1) allocated to Keil for petrography (Fig. 1). In 1976, two small chips of dark glass (,3) were allocated to Wasson for chemistry.

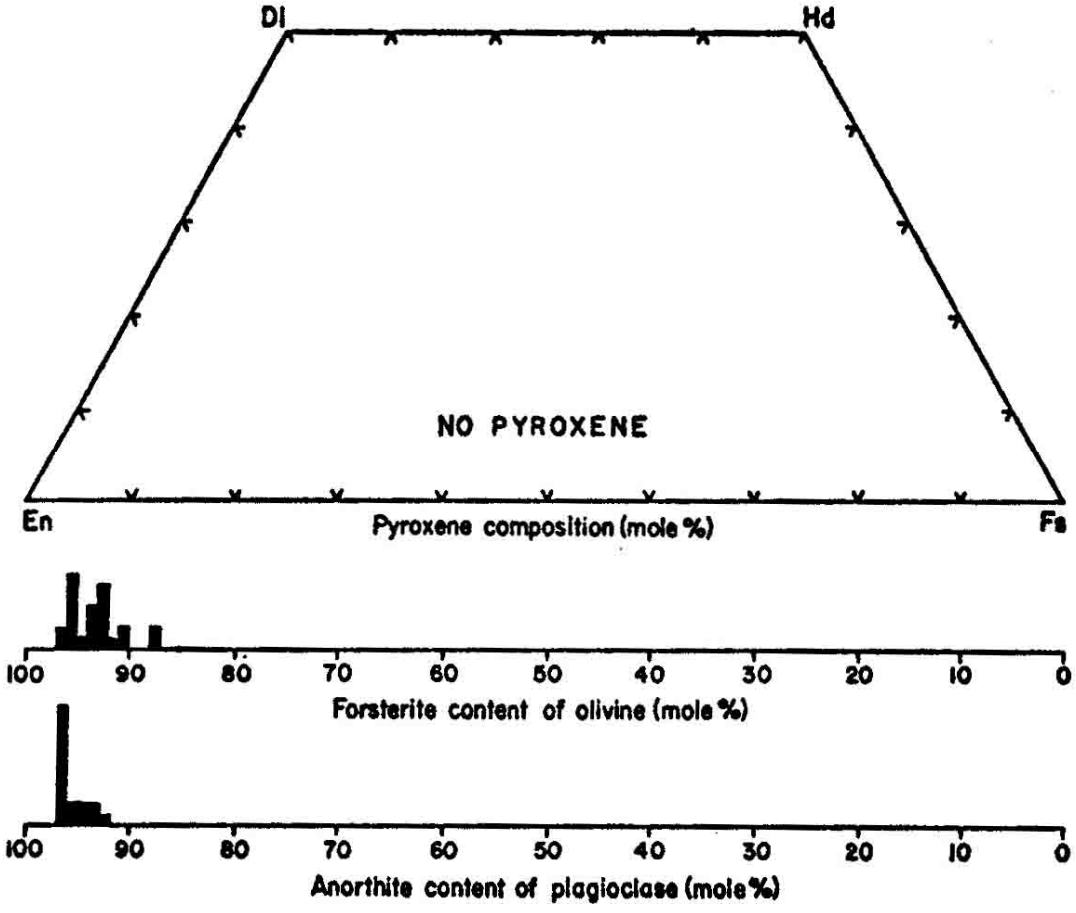

FIGURE 3. Mineral compositions;
from R. Warner et al. (1976b).

TABLE 1. Summary chemistry of 60666 lithologies.

	Dark, glassy melt (Wasson et al., 1977)	Basaltic clast, bulk (DBA, Dowty et al., 1974b)	Basaltic clast, excluding clasts) (DBA, Dowty et al., 1974b)
SiO_2		42.7	45.1
TiO_2	0.50	0.21	0.27
Al_2O_3	29.7	20.8	18.9
Cr_2O_3	0.12	0.11	0.14
FeO	5.57	4.2	5.0
MnO	0.07	0.05	0.05
MgO	6.5	18.6	19.0
CaO	15.4	11.7	11.0
Na_2O	0.473	0.39	0.36
K_2O	0.084	0.10	0.11
P_2O_5		0.04	0.06
Sr			
La	11.4		
Lu	0.49		
Rb			
Sc	6.5		
Ni	800		
Co	53		
Ir ppb	28		
Au ppb	9.0		
C			
N			
S			
Zn	<5.7		
Cu			

Oxides in wt%; others in ppm except as noted.