63549 FINE-GRAINED BASALTIC IMPACT MELT 26.6 g

INTRODUCTION: 63549 is a medium gray, coherent, fine-grained basaltic impact melt (Fig. 1). It is a rake sample and has zap pits.

FIGURE 1. Smallest scale division in mm. S-72-55375.

PETROLOGY: 63549 is classified as a porphyritic basalt by Warner et al. (1973) and as an olivine-free, basaltic-textured melt rock by Vaniman and Papike (1981). Both papers present microprobe data. Gooley et al. (1973) present metal and schreibersite compositional and petrographic data.

63549 is a basaltic impact melt (Fig. 2) with plagioclase laths 50-100 µm long (Vaniman and Papike, 1981) partly set in pyroxene and with a glassy mesostasis. Olivine is absent.

Mineral data are shown in Figure 3. Gooley et al. (1973) report metal data (Fig. 4). The metal is high in Ni; etching demonstrated that the metal was single phase. Gooley et al. (1973) note that 63549 has no relict mineral or lithic clasts i.e., it was totally molten.

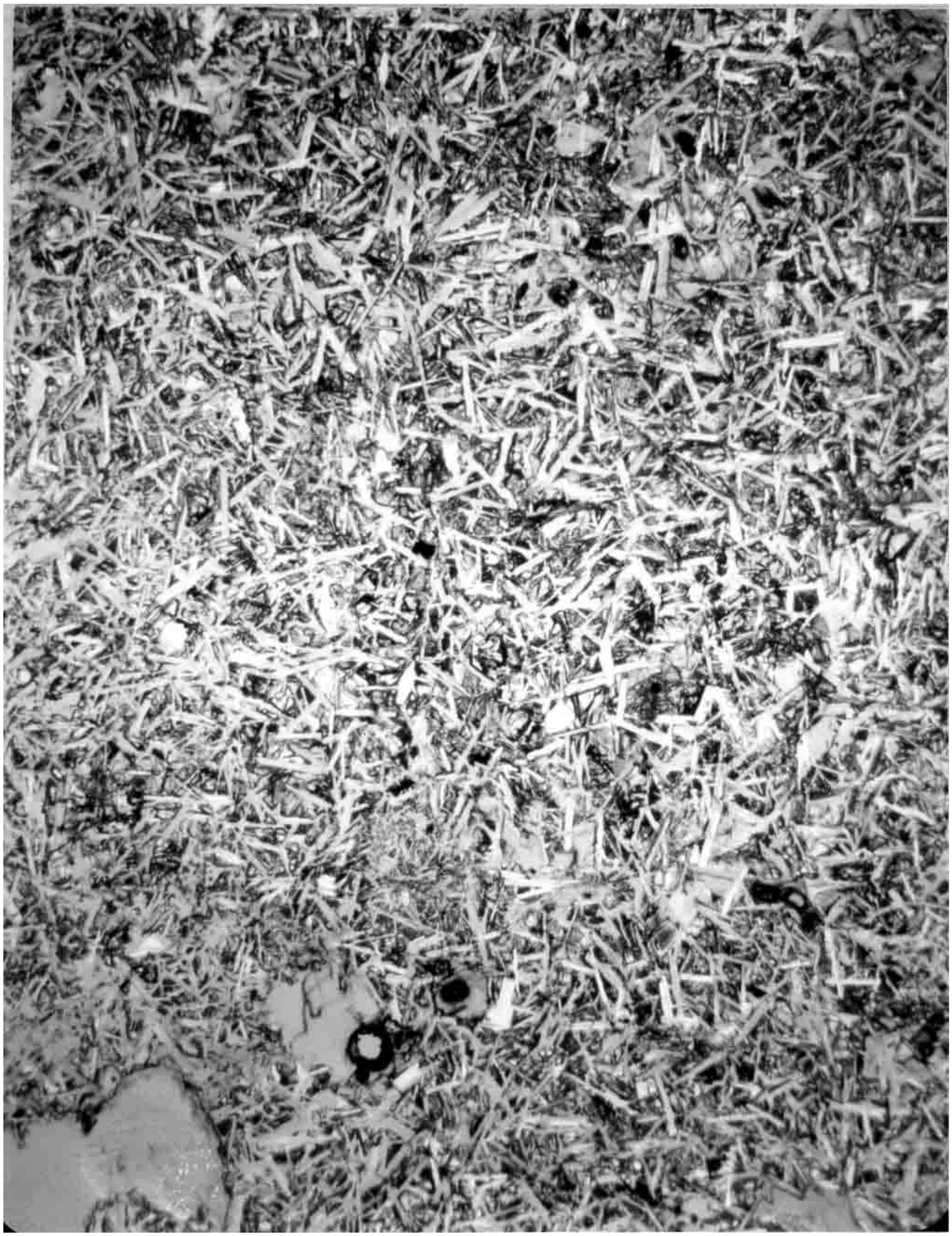

FIGURE 2. 63549,8, general view, ppl. Width 2 mm.

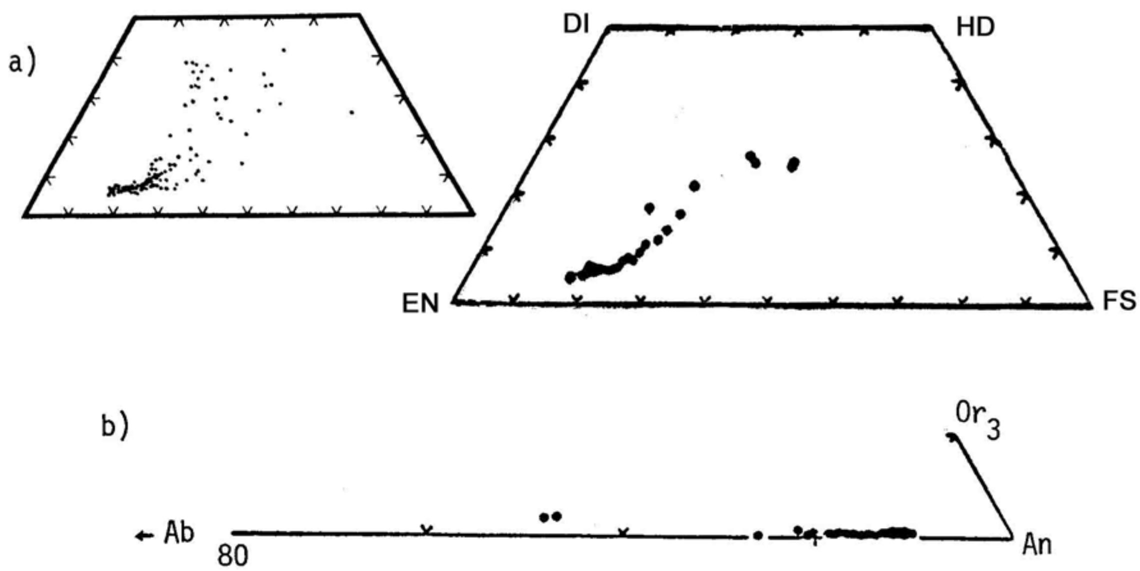

FIGURE 3.
a) Pyroxene compositions, from Warner et al. (1973), and Vaniman and Papike (1981).
b) Plagioclase compositions, from Vaniman and Papike (1981).

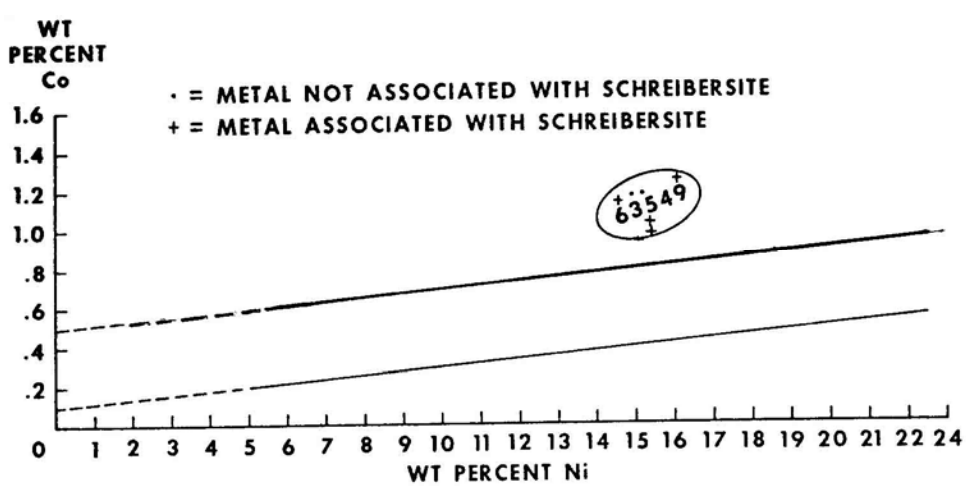

FIGURE 4. Metals, from Gooley et al. (1973).

CHEMISTRY: Hubbard et al. (1973) present a major element analysis and Hubbard et al. (1974) trace element analyses for chip ,2. Boynton et al. (1976) and Wasson et al. (1977) report comprehensive analyses, including major, siderophile, rare earth, and volatile elements, of chip ,9. Taylor and Bence (1975) report rare earth element data. The data are summarized in Table 1 and Figure 5. The basalt is more aluminous and lower in incompatible elements than local soils and most Apollo 16 basaltic impact melts. It has no significant europium anomaly (Fig. 5).

PHYSICAL PROPERTIES: Pearce and Simonds (1974) report magnetic parameters. The saturation remanence to saturation magnetization ratio is 0.007. Fe^0/Fe^{2+} is 0.0448 and total Fe^0 is 0.142 wt%.

PROCESSING AND SUBDIVISIONS: Several small chips were removed (Fig. 1) for thin sections and for chemical analyses. ,1 was made into thin sections ,5 and ,8. ,2 was partly consumed in the Hubbard et al. (1973, 1974) analyses, and ,3 was divided and partly consumed in the other chemical analyses.

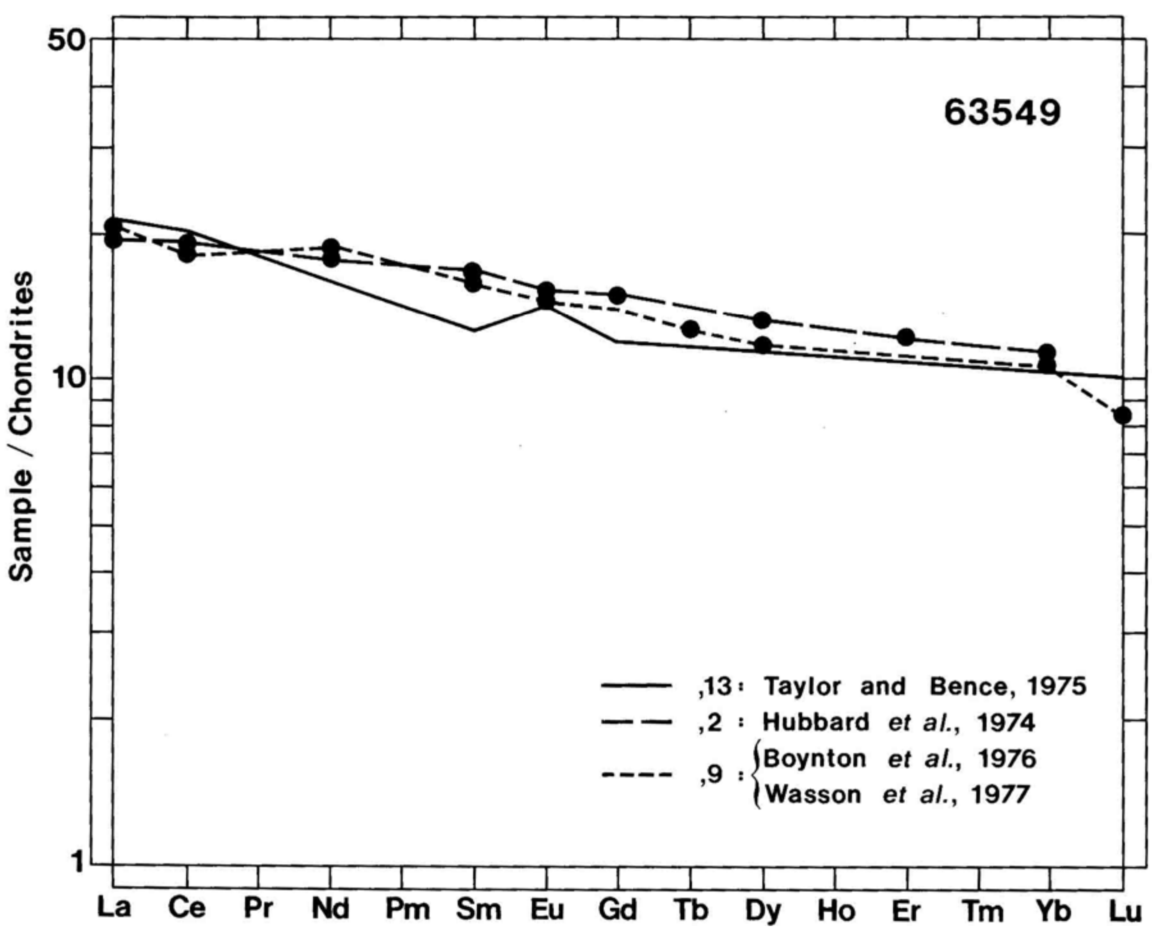

FIGURE 5. Rare earths.

TABLE 1. Summary chemistry of 63549.

SiO_2	45.7
TiO_2	∿0.4
Al_2O_3	29
Cr_2O_3	0.09
FeO	∿4.2
MnO	0.05
MgO	∿4.3
CaO	∿15.5
Na_2O	0.45
K_2O	0.07
P_2O_5	0.07
Sr	170.2
La	6.4
Lu	0.29
Rb	1.76
Sc	7.3
Ni	205
Co	18
Ir ppb	8
Au ppb	3.4
C	
N	
S	400
Zn	1.12
Cu	2.6

Oxides in wt%; others in ppm except as noted