"DUNITE" INCLUSION IN LUNAR BASALT 74275. C.E. Meyer and H.G. Wilshire, U.S. Geological Survey, Menlo Park, Calif. 94025.

A single small "dunite" inclusion was found in lunar sample 74275, a fragment of mare basalt collected from Shorty crater at the Apollo 17 site (AFGIT, 1973). The basalt has a subspherulitic texture and consists of 15.6% plagioclase, 34.9% clinopyroxene, 33.3% opaque minerals, and 16.1% olivine, of which 5.2% is phenocrysts and the remainder groundmass olivine. The lithic fragment is comparable in size to the largest olivine phenocrysts in the rock (fig. 1); it is composed entirely of olivine. The texture of the "dunite" is metamorphic and resembles the tabular texture of terrestrial ultramafic xenoliths in basalt (Mercier, 1972) in which olivine prisms are scattered sparsely in a granoblastic-polygonal matrix (figs. 2A,B). Both the olivine phenocrysts and the "dunite" fragment are compositionally zoned (fig. 3; Table 1), but grains in the center of the "dunite" are about 3% richer in Fo than the core compositions of the olivine. The core composition of olivine phenocrysts appears to be somewhat more magnesian than is typical of olivine phyric basalts from other missions (see for example Dowty and others, 1973), and the composition of the "dunite" olivine is within the range reported for lunar plutonic rocks but is toward the more iron-rich end of the range.

The "dunite" inclusion is comparable in size to so-called "dunite" reported from earlier missions (see Wilshire and Jackson, 1972), and all are probably much too small to be representative of any extensive rock mass. The presence of this metamorphic fragment in the basalt, however, suggests that the basalt has not undergone significant near surface fractionation.

References

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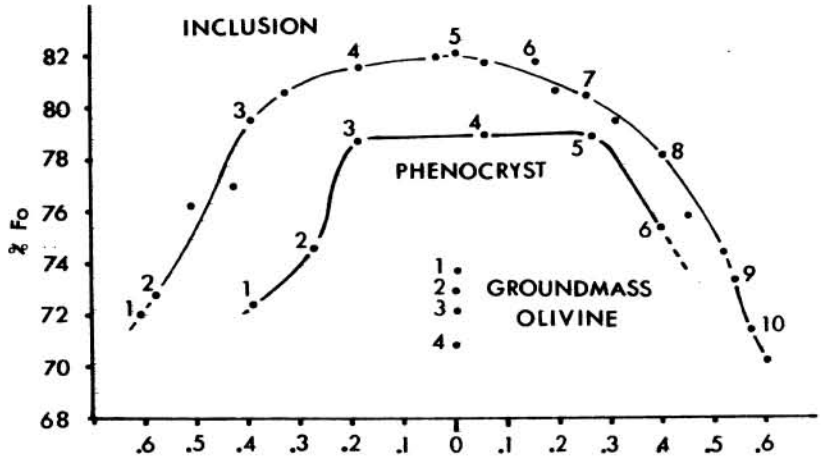

Distance From Apparent Grain Center (mm)

Fig. 3. Compositional variation in "dunite" inclusion and olivine phenocryst with respect to distance from grain center.

Table 1. Chemical Analyses

	Inclusion									
	1	2	3	4	5	6	7	8	9	10
SiO_2	36.3	36.8	37.8	38.6	38.5	38.7	38.7	38.5	36.8	36.8
FeO	25.6	25.1	19.3	17.5	17.0	17.4	18.4	20.6	24.8	26.6
MgO	36.8	37.7	42.0	43.2	43.7	43.5	42.8	41.3	38.6	37.3
MnO	.07	.24	.20	.20	.18	.19	.19	.21	.27	.28
Cr_2O_3		.14	.25	.23	.24	.24	.23	.26	.23	.23
NiO	.04	.04	.04	.04	.04	.04	.03	.04	.05	.04
Total	98.8	100.0	99.5	99.8	99.7	100.1	100.4	100.9	100.7	101.2
%Fo	72.0	72.8	79.6	81.6	82.1	81.7	80.5	78.2	73.5	71.4
	Phenocryst						Groundmass			
	1	2	3	4	5	6	1	2	3	4
SiO_2	37.0	37.0	37.8	38.3	38.1	37.5	37.1	37.0	36.6	36.6
FeO	25.2	23.3	19.6	19.6	19.5	22.7	24.2	24.7	25.5	26.6
MgO	37.1	38.4	41.2	41.3	41.1	39.0	37.9	37.6	37.2	36.2
MnO	.08	.07	.07	.08	.08	.08	.08	.07	.08	.09
Cr_2O_3										
NiO	.04	.05	.03	.05	.03	.04	.04	.04	.04	.05
Total	99.5	98.9	98.8	99.3	98.8	99.3	99.4	99.5	99.4	99.6
%Fo	72.4	74.6	78.9	79.0	79.0	75.4	73.7	73.0	72.2	70.8

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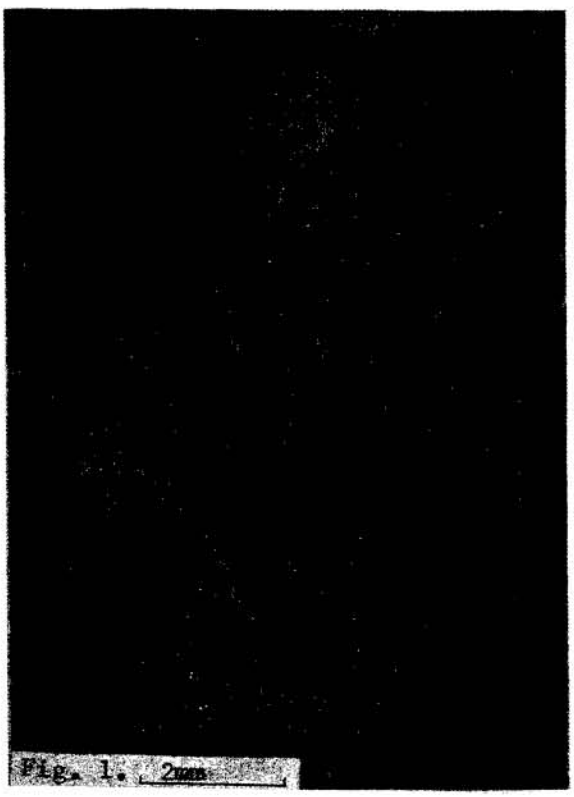

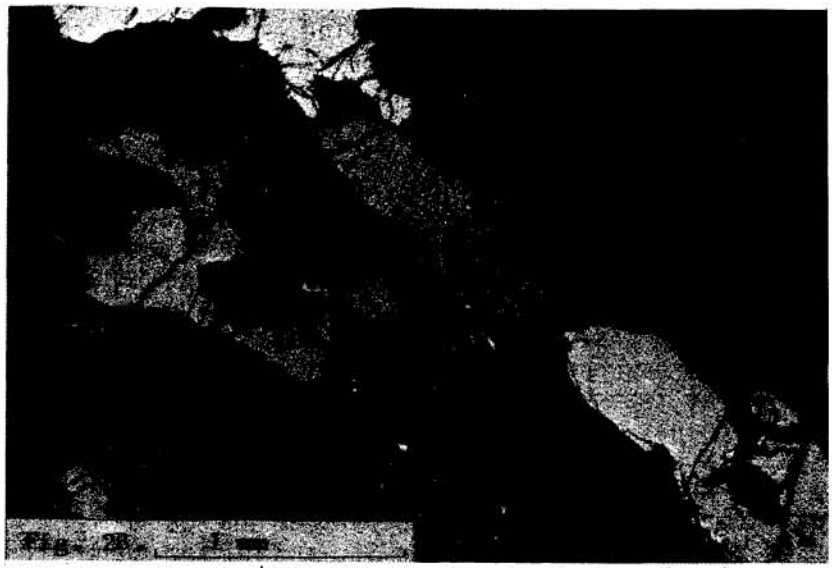

Fig. 1. Photomicrograph of 74275,97. Dunite inclusion (top) and olivine phenocrysts in subspherulitic matrix. Fig. 2A. Photomicrograph of "dunite" inclusion. Fig. 2B. Photomicrograph of tabular texture in dunite inclusion from terrestrial basalt.