62236 PRISTINE NORITIC ANORTHOSITE BRECCIA 57.3 g

INTRODUCTION: 62236 is a monomict breccia, uncontaminated by meteoritic siderophiles, and with mineral compositions indicating an affinity with ferroan anorthosites. These mineral compositions are similar to those in 62237 and, like 62237, it contains more mafic minerals (10-15%) than ferroan anorthosites sensu stricto. The sample is very light gray, angular, and fairly coherent but fractured (Fig. 1).

62236 was collected from the rim of Buster Crater, adjacent to 62235 and 62237, and its orientation is known. A few zap pits and a patina are present on all surfaces.

FIGURE 1. S-72-38955.

PETROLOGY: Warren and Wasson (1978, 1979) provide a petrographic description of the pristine anorthosite with microprobe mineral analyses. Takeda et al. (1979) report microprobe data on olivines, plagioclases, and exsolved pyroxenes, with x-ray information on the pyroxenes.

62236 is monomict and brecciated (Fig. 2). Original plagioclase and pyroxene grains

appear to include at least some larger than 1 mm. The mode is variable on a small scale, but in general the sample is ~85% plagioclase, and orthopyroxene dominates over olivine and clinopyroxene. (In 62237, in contrast, olivine dominates over pyroxene.) Cr-spinel, ilmenite (~3% MgO) and troilite are also present. The phase compositions (Fig. 3) are homogeneous, identical with those of 62237 and are in the field of ferroan anorthosites. Takeda et al. (1979) note that exsolved pyroxene is not common. X-ray data suggest that the orthopyroxene forms by pigeonite inversion. The exsolved augite has M-shaped Ca-profiles, the only ones so far reported from lunar samples. Cooling rate calculations from the exsolution lamellae suggest a depth of 6.7 km (22 μm blebs) for the origin of 62236.

CHEMISTRY: Warren and Wasson (1978, 1979) provide major and trace (including siderophile) element abundances for the sample. Clark and Keith (1973) report K, U, Th and radionuclide abundances for the rock, derived from y-ray spectroscopy.

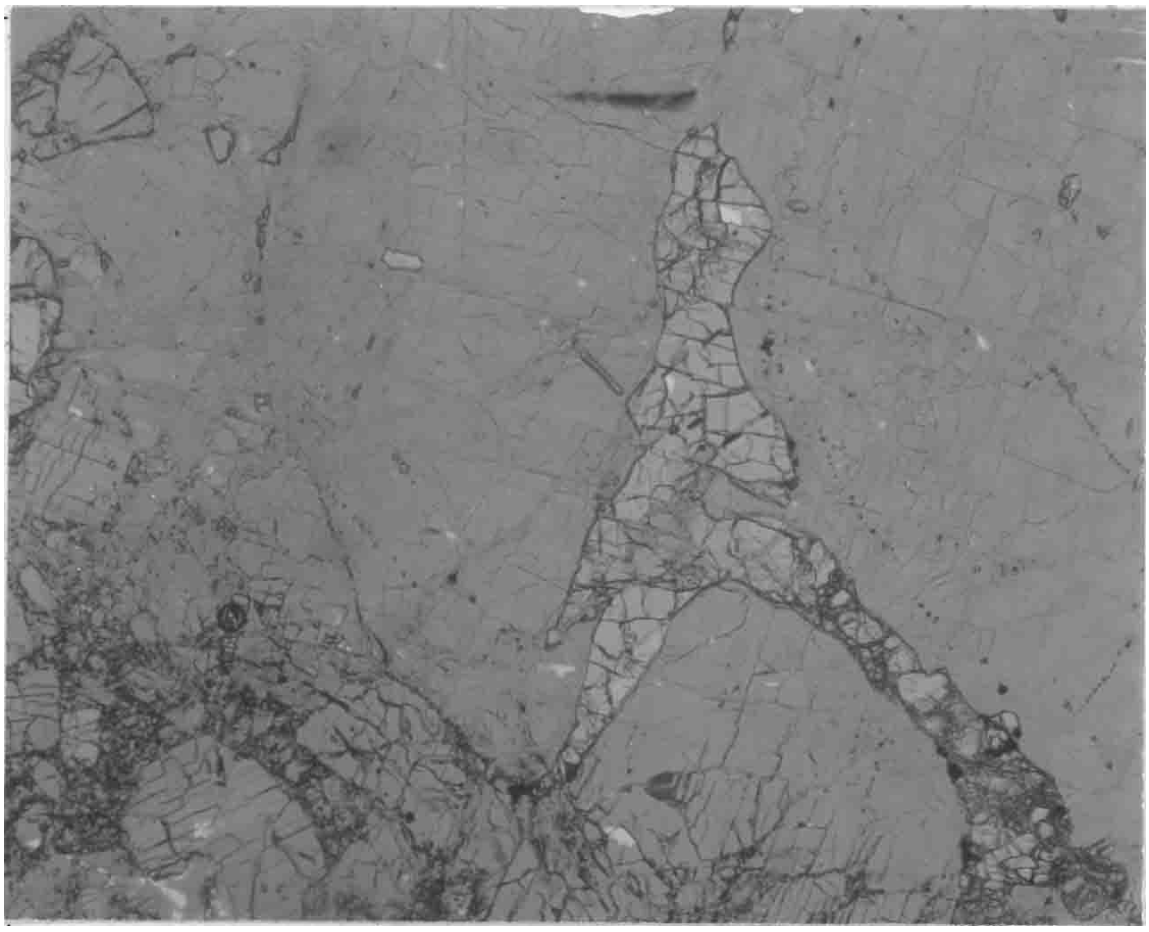

FIGURE 2. 62236,6, ppl. Width 1.5 mm.

62236 is extremely low in siderophile and incompatible elements indicating that it is a pristine lunar rock (Table 1, Fig. 4). Although it is more mafic than most other ferroan anorthosites, its rare-earth abundances are similar to pristine ferroan anorthosites and much lower than pristine troctolites and norites.

PROCESSING AND SUBDIVISIONS: The sample has not been sawn and only a few chips have been removed from ,0.

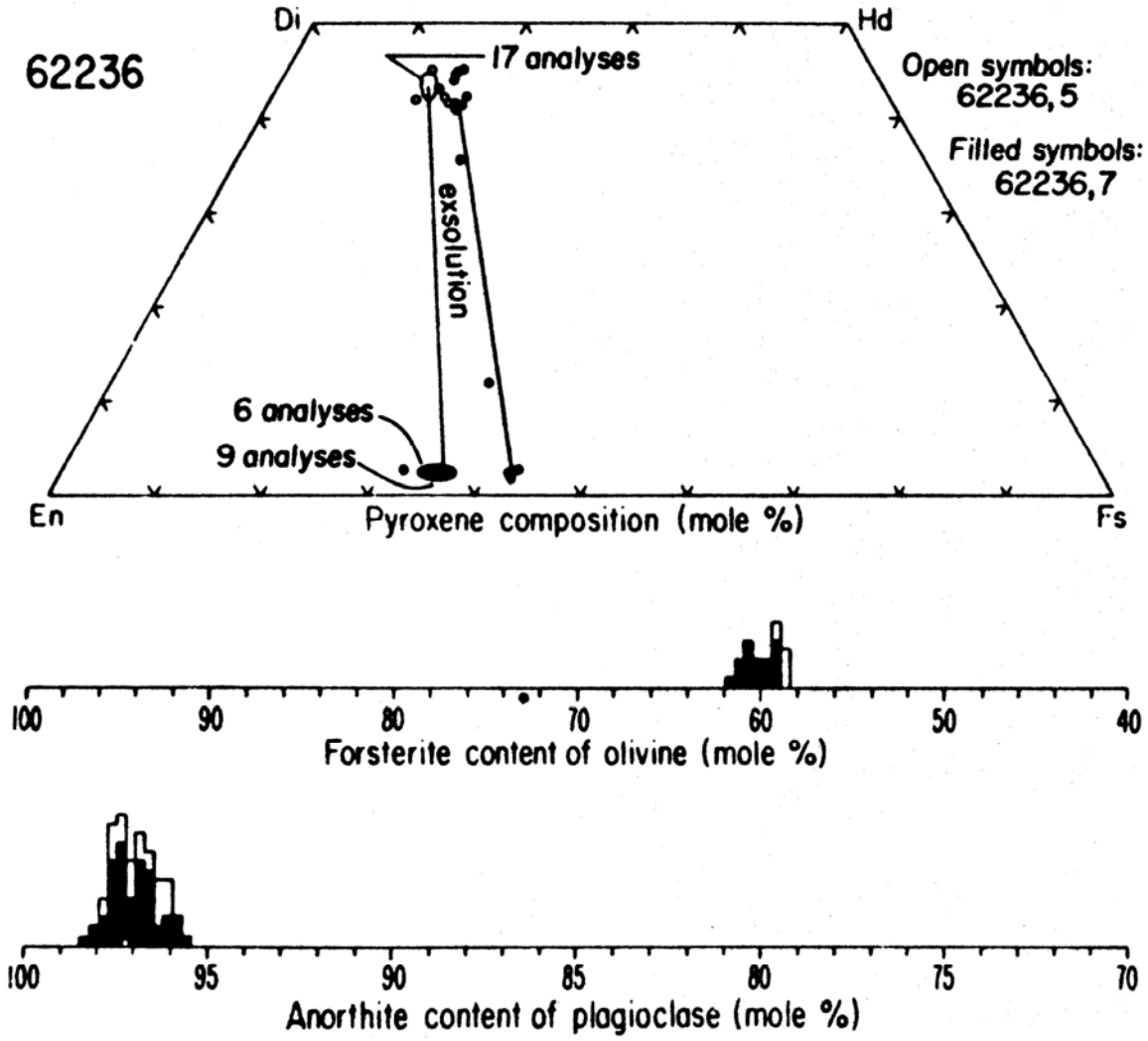

FIGURE 3a. Mineral compositions,
from Warren and Wasson (1979).

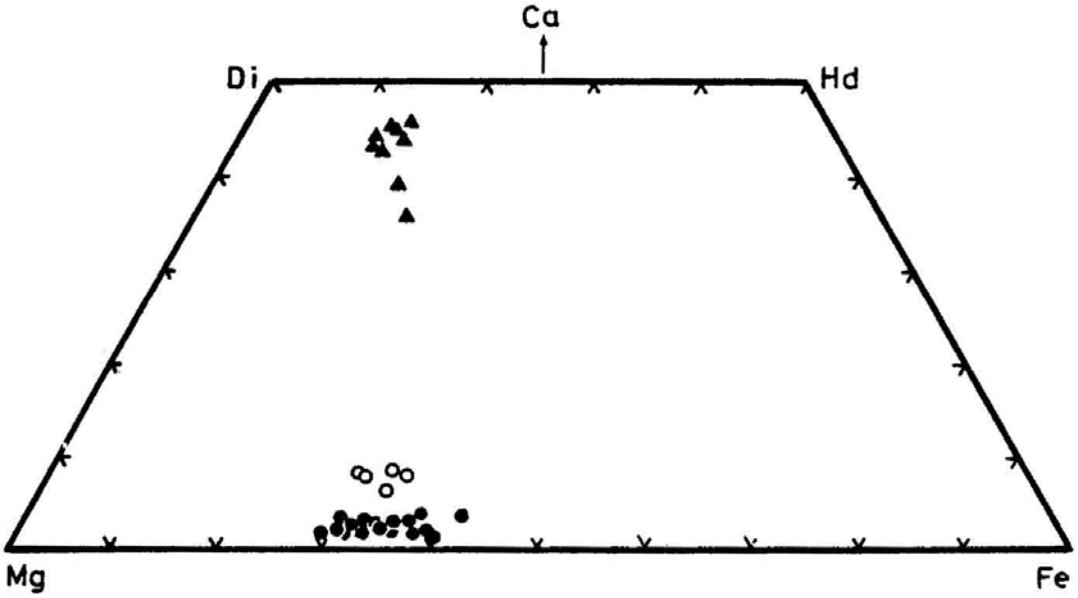

FIGURE 3b. Pyroxene compositions,
from Takeda et al. (1979).

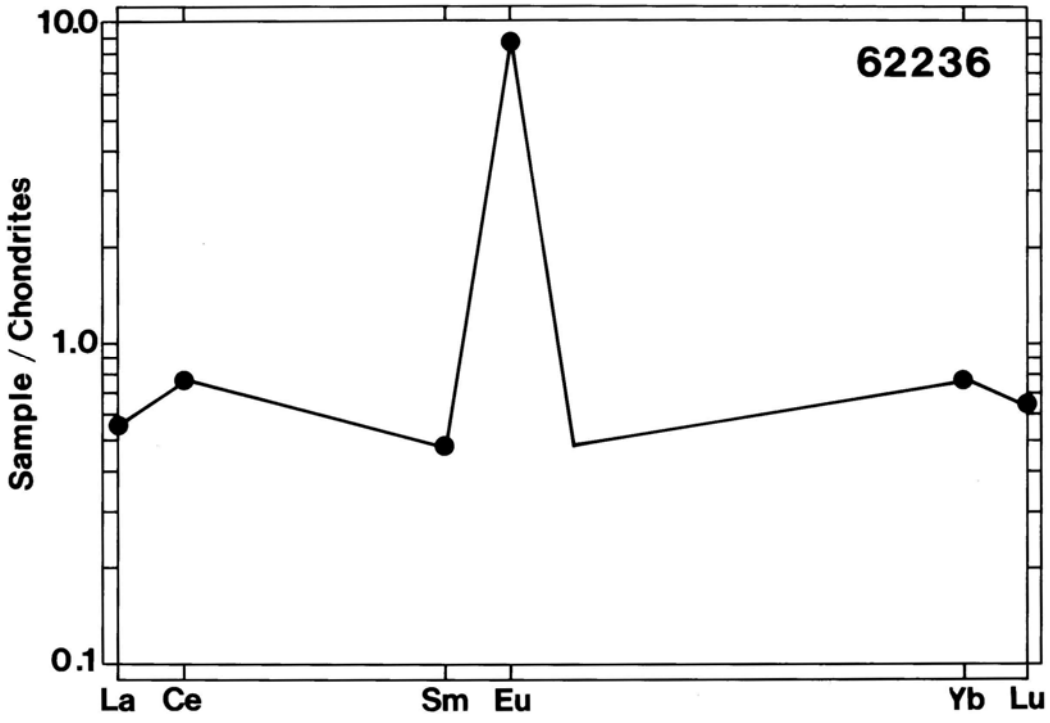

FIGURE 4. Rare earth elements,
from Warren and Wasson (1979).

TABLE 1. Summary chemistry of 62236.

SiO_2	44.2
TiO_2	
Al_2O_3	30.1
Cr_2O_3	0.07
FeO	3.7
MnO	0.05
MgO	3.5
CaO	17.6
Na_2O	0.215
K_2O	0.013
P_2O_5	
Sr	
La	0.18
Lu	0.021
Rb	
Sc	5.8
Ni	4.0
Co	7.9
Ir ppb	<0.028
Au ppb	<0.008
C	
N	
S	
Zn	2.0
Cu	

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