

15605 COARSE-GRAINED OLIVINE-NORMATIVE ST. 9A 6.1 g
MARE BASALT

INTRODUCTION: 15605 is a coarse-grained, olivine-bearing mare basalt which is very vesicular (Fig. 1). The olivine only rarely forms phenocrysts. In chemistry the sample is an average member of the Apollo 15 olivine-normative mare basalt group. The sample is brownish gray, stubby, angular, and tough, with the sparse yellow-green olivines visible macroscopically. The large (1 to 4 mm) vesicles compose about 15% of the rock. No zap pits were observed. 15605 was collected as part of the rake sample at Station 9A.



Figure 1. Post-split view of 15605. S-72-19842

PETROLOGY: 15605 is a coarse-grained, olivine-bearing mare basalt (Fig. 2). The olivines are anhedral and do not generally form phenocrysts, being only 1 mm or less in diameter. One olivine in thin section is an elongated, hollow, ragged phenocryst 3 mm long (Fig. 2). Generally the texture is gabbroic. The dominant phase is pigeonite which is commonly twinned and zoned outward to augite. Some contain small olivine cores or inclusions. Stubby plagioclase laths are generally interstitial but enclose some small pyroxenes and olivines; most plagioclases are about 1 mm long. Cristobalite and fayalite are present.



Fig. 2a



Fig. 2b

Figure 2. Photomicrographs of 15605,5.
Widths about 3 mm. a) transmitted light; b) crossed polarizers.
Grain crossing center from left to right is a hollow, anhedral olivine phenocryst.

CHEMISTRY: A bulk rock chemical analysis (Table 1, Fig. 3) shows 15605 to be a member of the Apollo 15 olivine-normative mare basalt group. The critical element Mg is imprecisely measured with the technique used, hence its apparent average nature is uncertain.

PROCESSING AND SUBDIVISIONS: 15605 was substantially chipped (Fig. 1), and ,0 is now 3.11 g. ,1 was made into a potted butt and partly used to make thin sections ,5 and ,6.

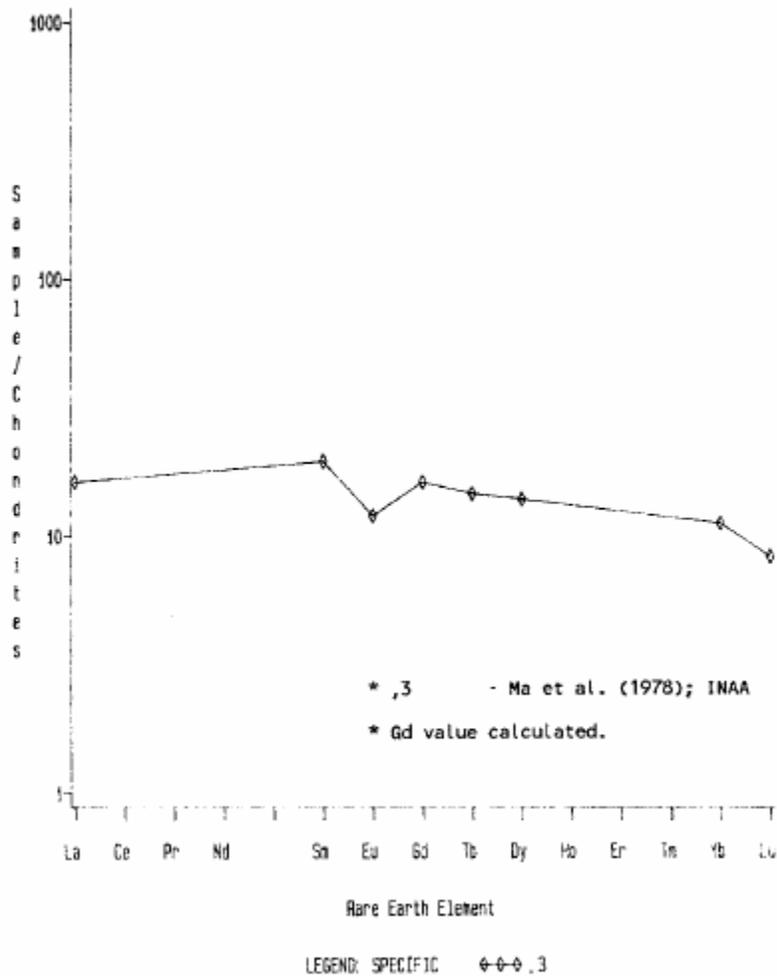


Figure 3. Rare earths in 15605.

TABLE 15605-1. Bulk rock chemical analysis ,3

| | | ,3 |
|-------|--------------------------------|-------|
| Wt. % | SiO ₂ | |
| | TiO ₂ | 2.1 |
| | Al ₂ O ₃ | 9.1 |
| | FeO | 22.3 |
| | MgO | 11 |
| | CaO | 10.1 |
| | Na ₂ O | 0.257 |
| | K ₂ O | 0.051 |
| | P ₂ O ₅ | |
| (ppm) | Sc | 42 |
| | V | 232 |
| | Cr | 4150 |
| | Mn | 1300 |
| | Co | 51 |
| | Ni | 40(a) |
| | Rb | |
| | Sr | |
| | Y | |
| | Zr | |
| | Nb | |
| | Hf | 2.5 |
| | Ba | 45(b) |
| | Th | |
| | U | |
| | Pb | |
| | La | 5.4 |
| | Ce | |
| | Pr | |
| | Nd | |
| | Sm | 3.6 |
| | Eu | 0.64 |
| | Gd | |
| | Tb | 0.7 |
| | Dy | 4.5 |
| | Ho | |
| | Er | |
| | Tm | |
| Yb | 2.3 | |
| Lu | 0.29 | |
| Li | | |
| Be | | |
| B | | |
| C | | |
| N | | |
| S | | |
| F | | |
| Cl | | |
| Br | | |
| Cu | | |
| Zn | | |
| (ppb) | I | |
| | At | |
| | Ga | |
| | Ge | |
| | As | |
| | Se | |
| | Mo | |
| | Tc | |
| | Ru | |
| | Rh | |
| | Pd | |
| | Ag | |
| | Cd | |
| | In | |
| | Sn | |
| | Sb | |
| | Te | |
| | Cs | |
| | Ta | 450 |
| | W | |
| | Re | |
| | Os | |
| | Ir | |
| | Pt | |
| | Au | |
| | Hg | |
| | Tl | |
| | Pb | |

References and methods:

(1) Ma *et al.* (1978); INAA

Notes:

- (a) +20 ppm
- (b) \pm 25 ppm