

70315
Ilmenite Basalt
148.6 grams

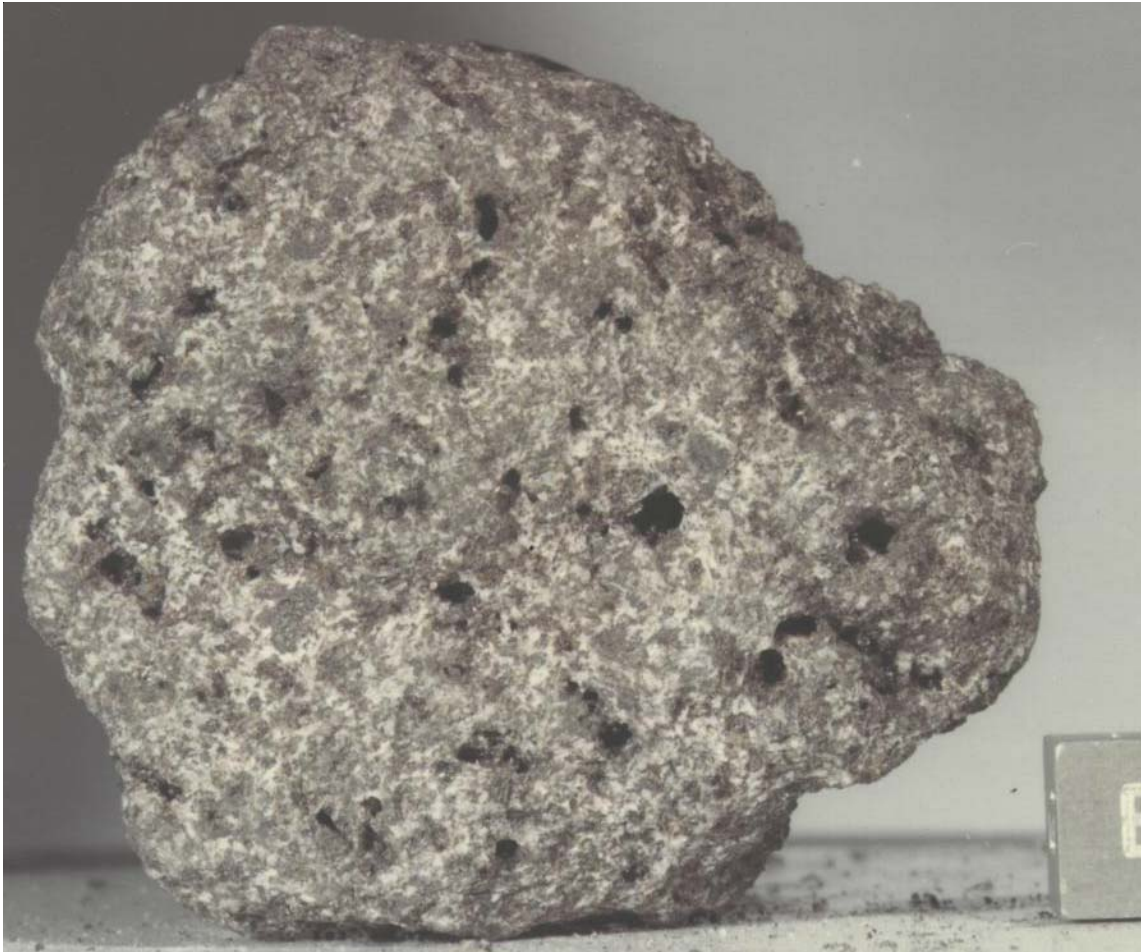


Figure 1: Photo of 70315. NASA S73-15453. Cube is 1 cm.

Introduction

70315 is a coarse-grained, vesicular basalt that has been rounded on all sides by micrometeorite bombardment (figure 1). It has not been well studied and no age is available.

Petrography

Neal and Taylor (1993) give the only description of 70315, although a mineral mode is found in Brown et al. (1975). Large pyroxene grains poikilitically enclose plagioclase and ilmenite (figure 2).

Chemistry

Warner et al. (1979) classified 70315 as type U (for unclassified!). Neal (2001) found that 70315 had low Rb content, but had a REE pattern similar to other

Mineralogical Mode of 70315

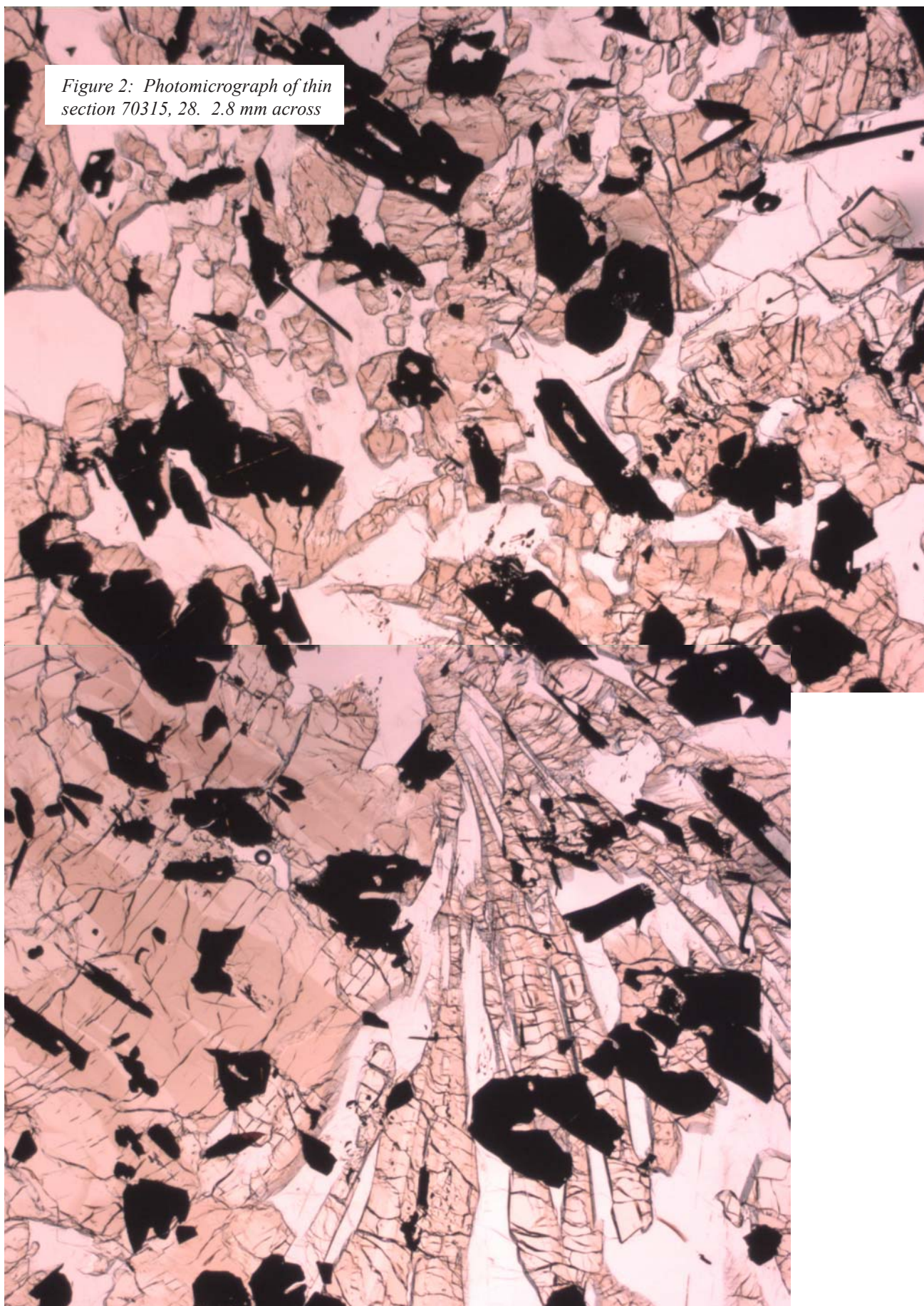
| | |
|-------------|-------------------|
| | Brown et al. 1975 |
| Olivine | 0.7 |
| Pyroxene | 50.6 |
| Plagioclase | 22 |
| Opakes | 25.5 |
| Silica | 0.6 |
| Meostasis | 0.6 |

Apollo 17 basalts (figure 5). Thus it remains “unclassified”.

Radiogenic age dating

Note: Apollo 17 mare basalts are generally considered 3.72 ± 0.04 b.y. old (see Paces et al. 1991).

Figure 2: Photomicrograph of thin section 70315, 28. 2.8 mm across



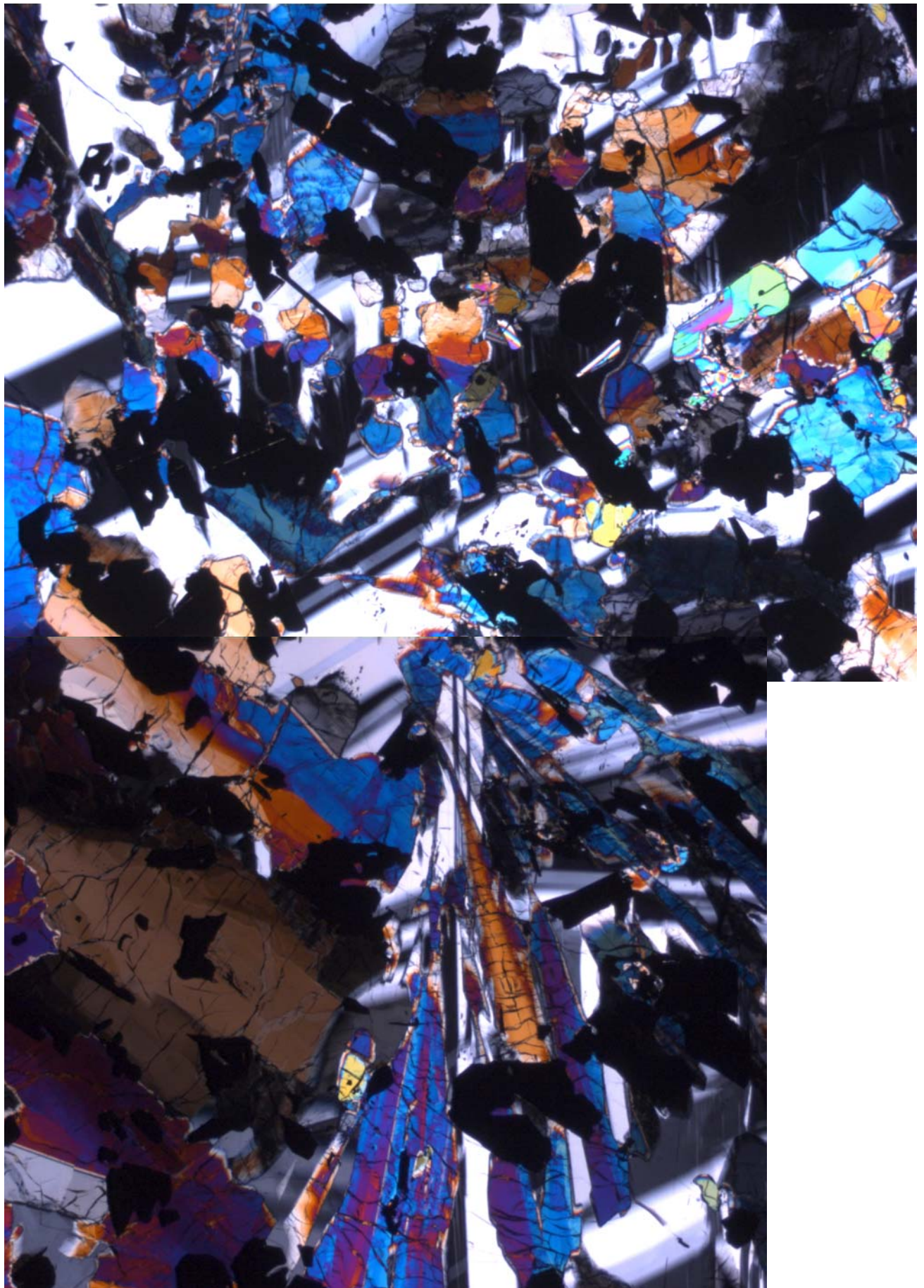


Table 1. Chemical composition of 70315.

| reference weight | Eldridge75 | Warner79 | Neal2001 | Garg76 |
|--------------------------------|------------|-----------|----------|---------|
| SiO ₂ % | | | | |
| TiO ₂ | | 13.1 (b) | | |
| Al ₂ O ₃ | | 9.3 (b) | | |
| FeO | | 17.9 (b) | | |
| MnO | | 0.24 (b) | | |
| MgO | | 10 (b) | | |
| CaO | | 10.2 (b) | | |
| Na ₂ O | | 0.387 (b) | | |
| K ₂ O | 0.048 (a) | 0.039 (b) | | |
| P ₂ O ₅ | | | | |
| S % | | | | |
| sum | | | | |
| Sc ppm | | 81 (b) | 79 (c) | |
| V | | 148 (b) | 146 (c) | |
| Cr | | 3742 (b) | 2790 (c) | |
| Co | | 20 (b) | 24 (c) | |
| Ni | | | 2.22 (c) | |
| Cu | | | 49.5 (c) | |
| Zn | | | 119 (c) | |
| Ga | | | 3.75 (c) | |
| Ge ppb | | | | |
| As | | | | |
| Se | | | | |
| Rb | | | 0.24 (c) | |
| Sr | | | 163 (c) | |
| Y | | | 66 (c) | |
| Zr | | | 197 (c) | 204 (b) |
| Nb | | | 21 (c) | |
| Mo | | | | |
| Ru | | | | |
| Rh | | | | |
| Pd ppb | | | | |
| Ag ppb | | | | |
| Cd ppb | | | | |
| In ppb | | | | |
| Sn ppb | | | | |
| Sb ppb | | | | |
| Te ppb | | | | |
| Cs ppm | | | | |
| Ba | | | 54 (c) | |
| La | 3.2 | (b) | 3.78 (c) | |
| Ce | 13 | (b) | 16.2 (c) | |
| Pr | | | 2.74 (c) | |
| Nd | 14 | (b) | 17.7 (c) | |
| Sm | 5.8 | (b) | 7.48 (c) | |
| Eu | 1.4 | (b) | 1.6 (c) | |
| Gd | | | 9.73 (c) | |
| Tb | 1.4 | (b) | 1.99 (c) | |
| Dy | 10 | (b) | 13.8 (c) | |
| Ho | | | 2.68 (c) | |
| Er | | | 7.76 (c) | |
| Tm | | | 1.05 (c) | |
| Yb | 5.6 | (b) | 7.88 (c) | |
| Lu | 0.81 | (b) | 1.06 (c) | |
| Hf | 5.7 | (b) | 6.39 (c) | 8.1 (b) |
| Ta | 1.3 | (b) | 1.44 (c) | |
| W ppb | | | | |
| Re ppb | | | | |
| Os ppb | | | | |
| Ir ppb | | | | |
| Pt ppb | | | | |
| Au ppb | | | | |
| Th ppm | 0.27 (a) | | 0.23 (c) | |
| U ppm | 0.1 (a) | | 0.07 (c) | |

technique: (a) radiation counting, (b) INAA, (c) ICP-MS

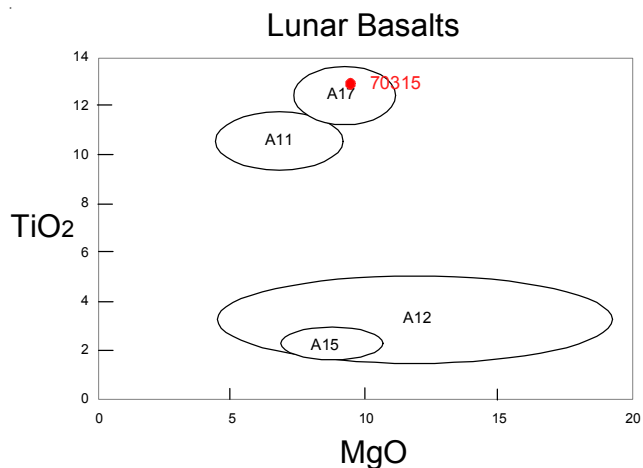


Figure 3: Composition of 70315 compared with other Apollo basalts.

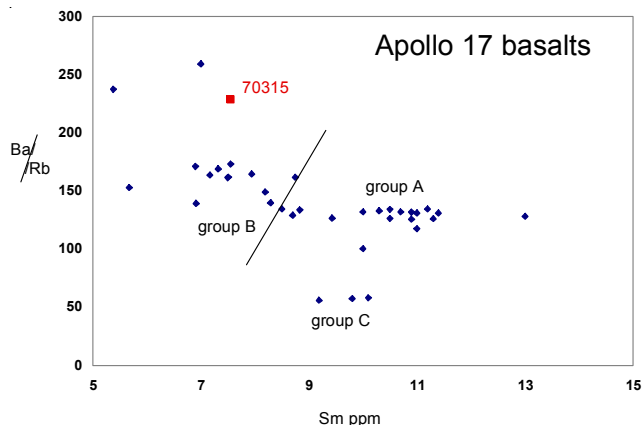


Figure 4: Trace element diagram used to classify Apollo 17 basalts.

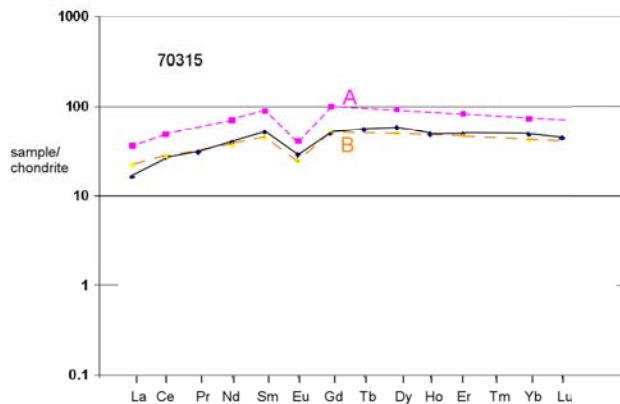
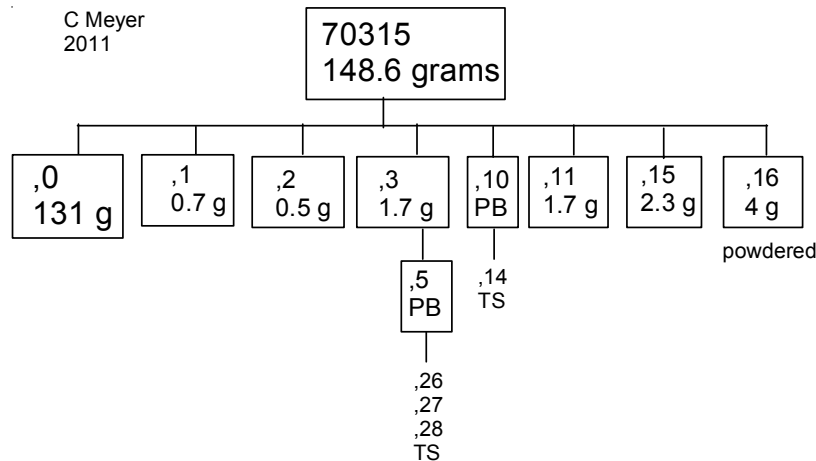


Figure 5: Normalized rare-earth-element diagram for 70315 and type A and B basalts.

Processing

There are 4 thin sections.



References for 70315

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