15666
Porphyritic Pigeonite Basalt
10.1 grams

Introduction
15666 was collected as part of the large rake sample from station 9a, on the rim of Hadley Rille. It is a pyroxene-phyric basalt with a variolitic groundmass (figure 2). It also includes some olivine.

Petrography
Dowty et al. (1973, 1974) and Nehru et al. (1974) studied the pyroxene phenocrysts (figure 3). They are euhedral, elongate and chemically zoned, with distinct boundaries. Vesicles and metallic iron grains are present. The groundmass is finely crystalline.

15666 was rapidly cooled. Using controlled experiments, Lofgren et al. (1974, 1975) and Grove and Walker (1977) determined the cooling rate and concluded that the rock formed about 15 cm from a “conductive boundary”.

Chemistry
Ma et al. (1976) give an analysis.

Processing
There are two thin sections of 15666.

Mineralogical Mode

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olivine</td>
<td>2%</td>
</tr>
<tr>
<td>Pyroxene</td>
<td>40%</td>
</tr>
<tr>
<td>Plagioclase</td>
<td></td>
</tr>
<tr>
<td>Opaques</td>
<td>5%</td>
</tr>
<tr>
<td>Silica</td>
<td></td>
</tr>
<tr>
<td>Meostasis</td>
<td>53%</td>
</tr>
</tbody>
</table>

Dowty et al. 1973

References for 15666

Butler P. (1971) Lunar Sample Catalog, Apollo 15. Curators’ Office, MSC 03209


Lunar Basalts

![Figure 4: Chemical composition of 15666 compared with other Apollo basalts.](image)

![Figure 5: Normalized rare-earth-element diagram for 15666, with 15601 soil for comparison.](image)

Ryder G. (1985) Catalog of Apollo 15 Rocks (three volumes). Curatoial Branch Pub. # 72, JSC#20787


Table 1. Chemical composition of 15666.

<table>
<thead>
<tr>
<th>Element</th>
<th>Reference</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>SiO2 %</td>
<td>46.9</td>
<td>(b)</td>
</tr>
<tr>
<td>TiO2</td>
<td>2.3</td>
<td>(a) 1.97 (b)</td>
</tr>
<tr>
<td>Al2O3</td>
<td>10.3</td>
<td>(a) 9.2 (b)</td>
</tr>
<tr>
<td>FeO</td>
<td>21.3</td>
<td>(a) 21.3 (b)</td>
</tr>
<tr>
<td>MnO</td>
<td>0.265</td>
<td>(a)</td>
</tr>
<tr>
<td>MgO</td>
<td>7.2</td>
<td>(a) 9.5 (b)</td>
</tr>
<tr>
<td>CaO</td>
<td>10.2</td>
<td>(a) 9.7 (b)</td>
</tr>
<tr>
<td>Na2O</td>
<td>0.37</td>
<td>(a) 0.37 (b)</td>
</tr>
<tr>
<td>K2O</td>
<td>0.063</td>
<td>(a) 0.02 (b)</td>
</tr>
<tr>
<td>P2O5</td>
<td>0.08</td>
<td>(b)</td>
</tr>
<tr>
<td>S %</td>
<td></td>
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</table>

**SiO2 weight:**

<table>
<thead>
<tr>
<th>Reference</th>
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<tbody>
<tr>
<td>Ma76</td>
<td>15387</td>
</tr>
<tr>
<td>Dowty73</td>
<td>15379</td>
</tr>
</tbody>
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**Trace Elements:**

- Sc ppm: 42 (a)
- V: 176 (a)
- Cr: 3320 (a) 3015 (b)
- Co: 37 (a)
- Ni: 49 (a)
- Cu
- Zn
- Ga
- Ge ppb
- As
- Se
- Rb
- Sr
- Y
- Zr
- Nb
- Mo
- Ru
- Rh
- Pd ppb
- Ag ppb
- Cd ppb
- In ppb
- Sn ppb
- Sb ppb
- Te ppb
- Cs ppm
- Ba: 40 (a)
- La: 6.8 (a)
- Ce
- Pr
- Nd
- Sm: 4.3 (a)
- Eu: 1.12 (a)
- Gd
- Tb: 0.88 (a)
- Dy: 5.1 (a)
- Ho
- Er
- Tm
- Yb: 2.5 (a)
- Lu: 0.47 (a)
- Hf: 3.2 (a)
- Ta
- W ppb
- Re ppb
- Os ppb
- Ir ppb
- Pt ppb
- Au ppb
- Th ppm: 0.41 (a)
- U ppm

**Notes:**

- INAA, AA (b) broad-beam e-probe