Donwilhelmsite

\[ \text{CaAl}_4\text{Si}_2\text{O}_{11} \]

**Crystal Data:** Hexagonal. *Point Group: 6/m 2/m 2/m.* As acicular crystals to 20 \( \mu \text{m}. \)

D(calc.) = 3.905 (synthetic \( \text{CaAl}_4\text{Si}_2\text{O}_{11} \))

*Optical Class:* n.d.

**Cell Data:**  
Space Group: \( P6_3/mmc \).  
\( a = 5.42(1) \)  
\( c = 12.70(3) \)  
\( Z = 2 \)

**X-ray Powder Pattern:** n.d.

**Chemistry:**

| Element | Formula | Weight
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>( \text{Al}_2\text{O}_3 )</td>
<td>52.7</td>
<td></td>
</tr>
<tr>
<td>( \text{Si}_2\text{O}_5 )</td>
<td>32.6</td>
<td></td>
</tr>
<tr>
<td>( \text{CaO} )</td>
<td>15.0</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0</td>
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</table>

(1) Oued Awlitis 001 lunar meteorite; average of 10 TEM-EDS analyses supplemented by micro-Raman spectroscopy; corresponds to \( \text{Ca}_{1.02}\text{Al}_{3.92}\text{Si}_{2.06}\text{O}_{11} \).

**Occurrence:** In shock melt pockets of roughly anorthitic bulk composition in a feldspathic lunar meteorite. Formed from primordial feldspathic lunar crust during impact cratering events. Forms in Earth’s mantle during deep recycling of aluminous crustal materials and is a key host for Al and Ca of subducted sediments in most of the transition zone and uppermost lower mantle (460-700 km).

**Association:** Ca-rich plagioclase, olivine, pyroxene, Fe-Ni metal, troilite, ilmenite, Ti-rich spinel, apatite, zircon, baddeleyite, “silica”.

**Distribution:** From the feldspathic lunar meteorite Oued Awlitis 001.

**Name:** Honors Don E. Wilhelms (b. 1930) for his seminal and ground-breaking work on the geological history of the Moon.

**Type Material:** Meteorite collection, Natural History Museum, Vienna, Austria (NHMV-O104).

**References:**  
(2) Gautron, L., R. Angel, and R. Miletich (1999) Structural characterization of the high-pressure phase \( \text{CaAl}_4\text{Si}_2\text{O}_{11} \). Phys. Chem. Min. 27, 47-51.