# Euclase BeAlSiO4(OH)

# Grandfathered valid species

Monoclinic Point Group 2/m Nickel – Strunz 09.AE.10

The type locality of the first specimen introduced to Europe by the naturalist Joseph Dombey in 1785 was the State of Minas Gerais, Brazil. It was described and named by the French mineralogist René Just Haüy. The name derives from Greek and refers to its ease of fracturing.

Euclase crystals commonly comprise single and multiple groups of prismatic or tabular habit, often with complex faces and not uncommonly doubly-terminated by wedge-like faces. It has one perfect cleavage parallel to (010) and imperfect cleavages parallel to (001) and (110); a Mohs hardness of 7.5 and a brittle tenacity. Specific gravity is typically in the range 2.99 to 3.10.

RI values *n*α = 1.651-1.653; *n*β = 1.655-1.657; *n*γ = 1.669 -1.675 with a maximum birefringence δ = 0.02.; 2Vℽ ~ 50o. Crystals from sources worldwide occur in a range of colours that include blue, blue–green and yellow, as well as colourless. Some crystals display sectored colour zoning including hour-glass type. Pleochroism is apparent in shades of blue.

Euclase occurs as a secondary mineral, commonly after beryl, in granitic pegmatites, greisens and miarolitic cavities. It also occurs in Alpine-type hydrothermal veins. It is a rare mineral and may be found together with other beryllium minerals including bertrandite and phenakite.

There are two recorded occurrences of euclase in Western Australia.

**Yilgarn Craton**

**Dalgaranga pegmatite**

**Zone 50, AGD66 521400E 6934938N Dalgaranga (2342)**

The first occurrence of euclase identified in Western Australia in 1962 was from a heavy mineral concentrate obtained from the Dalgaranga beryl-tantalite pegmatite, part of the Dalgaranga-Mount Farmer pegmatite field located some 70 km northwest of the town of Mount Magnet in the Murchison Terrane of the Yilgarn Craton.

The Government Chemical Laboratories noted euclase in the heavy mineral fraction containing a small percentage of tantalum minerals, chiefly microlite, which was isolated from Dalgaranga ore. The x-ray pattern, taken to confirm the optical and chemical diagnosis, was identified by comparison with Brazilian euclase.

*Reference*: Government Chemical Laboratories, 1962.

**Giles columbite-beryl pegmatite**

**Zone 51, AGD66 354850E 6541500N Yilmia (3135)**

In 2012, a single euclase crystal was discovered in a thin layer of loose material excavated from the south-eastern part of the main open pit at the Giles columbite–beryl pegmatite, part of a group of small pegmatites located in the Eastern Goldfields Superterrane of the Yilgarn Craton. The pegmatites, extending for approximately 5 km in a north–south direction and containing six named groups, are located in the Spargoville area some 45 km southeast of Coolgardie.

The white, translucent to transparent euclase crystal is doubly-terminated, measures 14 × 9.5 × 7.2 mm and weighs 2.063 g (Fig. 1). It has a thick tabular habit, elongated parallel to the clino axis direction and has a rhombic form transverse section in this direction. The dominant faces are prisms (011) that have smooth surfaces and well-defined clinopinacoid faces (010).

Initial identification was made by optical mineralogical techniques and observations and results compared to a sample of euclase from Zimbabwe. The optic figure is biaxial positive with a small 2V, and the specific gravity was determined as 3.075.

A semi-quantitative SEM-EDS partial microanalysis of the euclase crystal is shown in Table 1, with the composition of euclase from Brazil for comparison.

The euclase surfaces are encrusted with microscopic, colourless crystals of bertrandite that measured from 0.2 to 0.4 mm long.

Although the ages of the Neoarchean Giles and Dalgaranga pegmatites are poorly constrained, the occurrences of euclase in these localities are probably the oldest discovered so far in the geological record worldwide.

*Reference*: Stocklmayer S, 2017

**Table 1. Comparison of euclase compositions from** **Brazil (Graziani and Guido, 1980 quoted in Stocklmayer, 2017) and the Giles columbite–beryl pegmatite (Spargoville, Western Australia), with calculated ideal euclase**

**Figure 1** Euclase from the Giles columbite–beryl pegmatite. Crystal is 14 mm in length. Specimen Sue Koepke, photo Geoff Deacon.

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| *wt. %* | *Santo do Encoberto, Brazil* | *Giles columbite–beryl pegmatite, Spargoville* | *Calculated composition of ideal, or ‘pure’*  *euclase* |
| SiO2 | 41.6 | 43.04 | 41.41 |
| Al2O3 | 34.76 | 34.06 | 35.14 |
| FeO | 0.28 | - | - |
| BeO | 16.95 | - | 17.24 |
| Na2O | 0.13 | - | - |
| K2O | 0.04 | - | - |
| H2O | 5.95 | - | 6.21 |
| Total | 99.71 | 77.1 | 100.00 |

**References**

Government Chemical Laboratories, 1962. *Annual Report of the Department of Mines for 1962*: Government Printer, Perth, Western Australia, p. 173.

Stocklmayer S, 2017. A new occurrence of euclase in Western Australia, *Australian Journal of Mineralogy*, v. 18(2), p. 39-44.