



STRUCTURAL SCIENCE
CRYSTAL ENGINEERING
MATERIALS

Volume 74 (2018)

Supporting information for article:

Ba₂Ca₁₈(SiO₄)₆(PO₄)₃(CO₃)F₃O: modular structure and disorder of a new mineral with single and triple antiperovskite layers

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Aravaite, $\text{Ba}_2\text{Ca}_{18}(\text{SiO}_4)_6(\text{PO}_4)_3(\text{CO}_3)\text{F}_3\text{O}$: modular structure and disorder of a new mineral with single and triple antiperovskite layers

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Acta Crystallographica B74, [DOI:10.1107/S2052520618012271](https://doi.org/10.1107/S2052520618012271)

Appearance and physical properties

Colour: colourless

Streak: white

Lustre: vitreous; transparent

Non-fluorescent

Hardness (Mohs): ≈ 5

Hardness VHN 25 = 486(29) $\text{kg}\cdot\text{mm}^{-2}$ (average of 10 analyses ranging from 444 to 534 $\text{kg}\cdot\text{mm}^{-2}$)

Cleavage: imperfect on (001)

Parting: not observed

Tenacity: brittle

Fracture: irregular, flat

Density: could not be measured because aravaite crystals are highly fractured and consequently it was not possible to extract fragments bigger than 20-30 μm .

Density (calc.): 3.327 $\text{g}\cdot\text{cm}^{-3}$

Optical properties

Uniaxial (-); $\omega = 1.658(2)$, $\varepsilon = 1.654(2)$ ($\lambda = 589 \text{ nm}$)

Non-pleochroic

Morphology

Habit: platy

Twinning: not observed

The $c:a$ ratio calculated from unit-cell parameters is 9.30.

Name

The mineral name Aravaite (Аравайт) is chosen after the geographical name Arava Valley, located nearby the type location of the new mineral. Arava (Hebrew: *desolate and dry area*) is a geographic area south of the Dead Sea basin, which forms part of the border between Israel and Jordan. The Arava or Arava Valley is 166 km in length and extends from the Gulf of Aqaba (Red Sea) to the southern shore of the Dead Sea.

Type Material

Type material was deposited in the mineralogical collection of the Fersman Mineralogical Museum, Leninskiy pr., 18/κ2, 115162 Moscow, Russia, catalogue numbers: 4960/1.