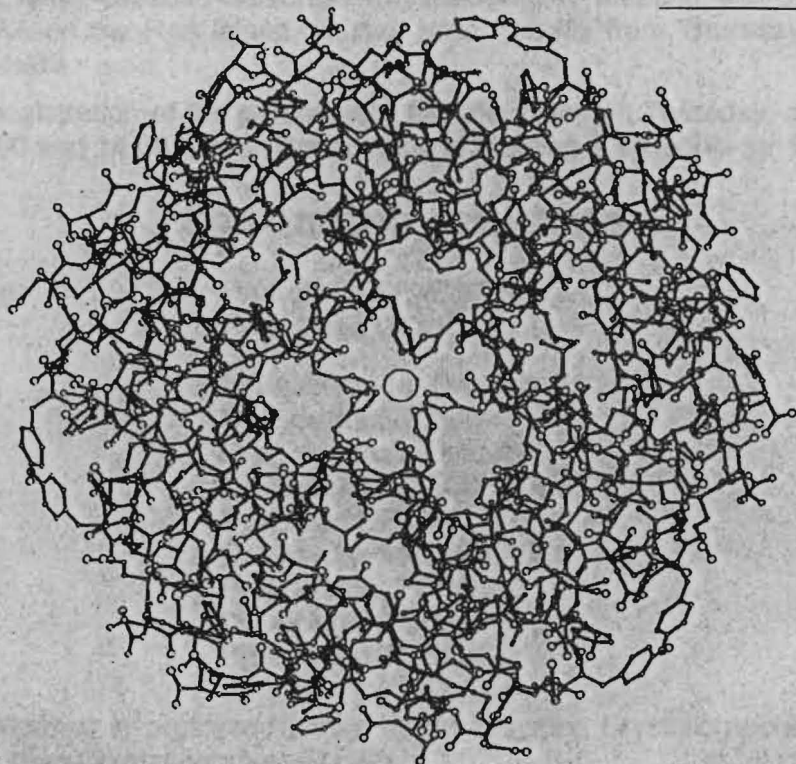


CROATIAN CRYSTALLOGRAPHIC ASSOCIATION
SLOVENIAN CRYSTALLOGRAPHIC SOCIETY

EIGHTH CROATIAN - SLOVENIAN CRYSTALLOGRAPHIC MEETING

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*This Meeting is Dedicated to the Memory of
Professor Dorothy C. Hodgkin on the Occasion
of 35th Anniversary of her Nobel Prize for Chemistry,
30th Anniversary of the Insulin Structure Elucidation*

**BOOK OF ABSTRACTS
PROGRAMME**

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THE WORLD BIGGEST CRYSTALS OF THE BRUCITE, Mg(OH)₂, FROM RŽANOVO, MACEDONIA

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Within highly altered peridotite host rock in Ržanovo region, south of Kavadarci, big acicular, colorless crystals were found. X-ray powder diffraction pattern shows that this mineral is brucite.

Crystals up to 80 cm in size were found in serpentinised ultrabasic rocks, within veins. Needles are perpendicular to vein walls.

Its unit cell is: $a=3.1458(7)$, $c=4.766(2)$ Å (rhombohedral $a=2.4130$ Å, $\alpha=81.36^\circ$) V 40.84(2) Å³, Z 1.

Means of 4 sets of microprobe data combined with thermogravimetric measurement of H₂O yield in complete analysis:

MgO 61.460, FeO 1.490, MnO 0.316, CaO 0.152, Na₂O 2.310, K₂O 0.102, SiO₂ 1.840, Al₂O₃ 3.230, SiO₂ 1.840, H₂O 29.705 Total, 100.495 wt.%. Than empirical formula is: $(Mg_{0.898}Fe_{0.012}Mn_{0.003}Na_{0.040}K_{0.001}Ca_{0.002}Al_{0.037}Si_{0.018}P_{0.001})(OH)_2$.

Weight decreasing starts at about 400°C and finish at about 470°C what is consistent with strong exothermal peak assigned to dehydration.

Its calculated density is 2.447 g/cm³.

It is not likely that P, Si, Al, Ca, K, and Na are really incorporated in crystal structure of brucite, but there was no single solid inclusion visible in the optical microscope. But, thin sections of this mineral show low birefringence and significant optical axial angle. It is also uncommon that needles of brucite show biaxial optical figure, with high optical axial angle. It is normally, as hexagonal mineral, uniaxial, but this anomaly could be explained due to the pressure acting to the extremely long crystals. Structural anomalies are not expected. It is also possible that needles of brucite are mixed with much less needles of serpentine. This would explain small percentage of Si and Al in the analyses.

There is no high Mn content in the brucite from Ržanovo, what was explanation for acicular growth of this mineral in many other occurrences.

Brucite from Ržanovo is the example of the biggest known crystal of these mineral in the world. It is a product of hydrothermal alteration of peridotitic host rock. In this process dolomite is also produced. Dolomite is also very pure and close to the end-member. Microprobe analyses gave next result:

CaO 30.07, MgO 21.63, FeO 0.47, MnO 0.83, K₂O 0.01, Na₂O 0.01, Al₂O₃ 0.01, CO₂ 47.22, Total 100.25 what yield in formula unit: $(Ca_{0.99}Mg_{0.99}Mn_{0.02}Fe_{0.01})_{\Sigma 2.01}(CO_3)_2$.

This is nice and rare example of nearly pure end-member of one mineral.

Among the measured trace elements, just Ni is elevated (about 2 ppm) in brucite and Sr (about 1 ppm) in associated dolomite and all other elements are insignificant (As, Ag, Cr, Zn, Cu, Pb, Cd, Co, Tl, Y, Sr, Ba, and Ga).