

## Mitridatite: a remarkable octahedral sheet structure

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MITRIDATITE has  $a$  17.53,  $b$  19.35,  $c$  11.25 Å,  $\beta$  95.92°, space group  $A2/a$  (Moore, 1974) and is closely related to robertsite and arseniosiderite. Its structure (the atomic co-ordinates of which are given) is based on a compact sheet,  $\text{Fe}_9^{3+}\text{O}_6(\text{PO}_4)_9^{12-}$ , with pseudotrigonal symmetry (fig. 1), formed from a ring of nine  $\text{FeO}_6$  octahedra with a  $\text{PO}_4$  tetrahedron at the centre, linked by two further  $\text{PO}_4$  tetrahedra in the plane of the sheet and by six more  $\text{PO}_4$  tetrahedra above and below the plane of the sheet (not shown on fig. 1); Ca ions and  $\text{H}_2\text{O}$  molecules lie between these sheets, the Ca in a  $\text{CaO}_5(\text{H}_2\text{O})_2$  polyhedron, and three water molecules not linked to any metal complete the asymmetric unit  $\text{Ca}_6(\text{H}_2\text{O})_6\text{Fe}_9^{3+}\text{O}_6(\text{PO}_4)_9 \cdot 3\text{H}_2\text{O}$ .

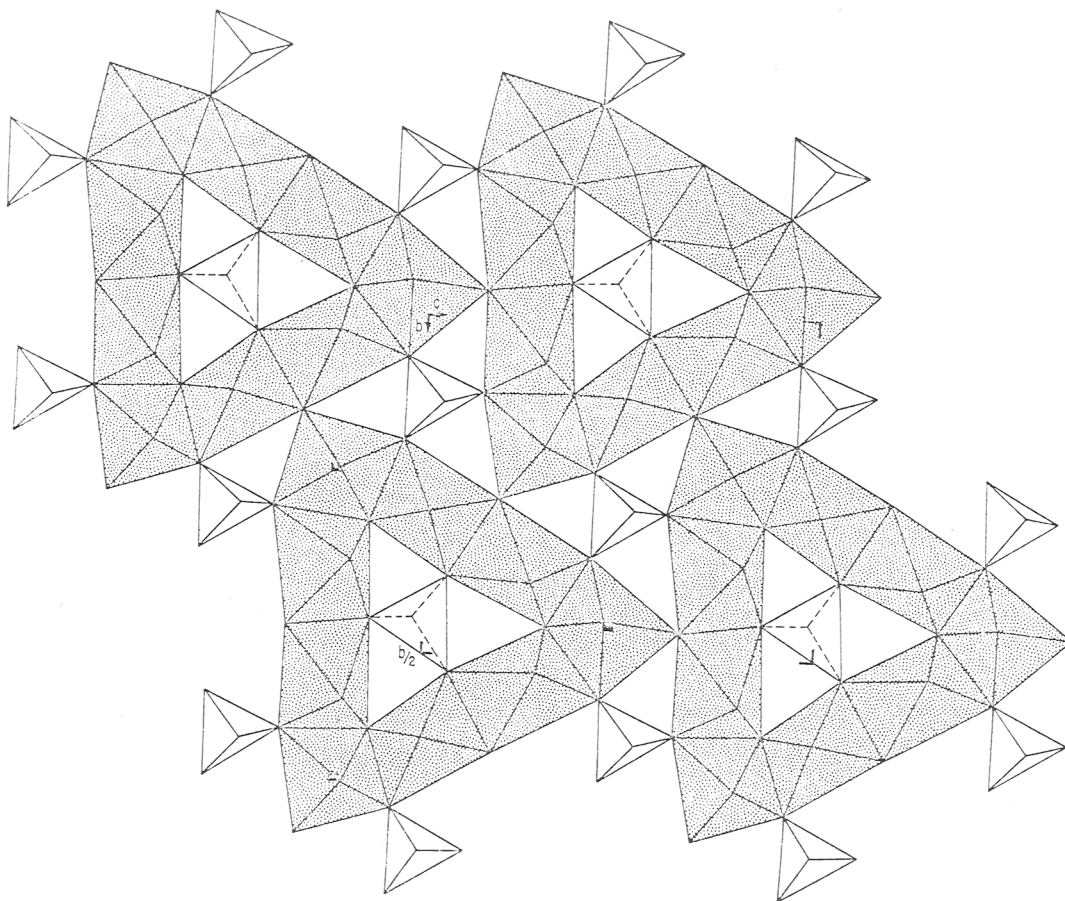


FIG. 1. The basic unit of the mitridatite structure.

Betpakdalite and melkovite, which have unit cells dimensionally similar to that of mitridatite, may be related structurally. Other structures, known or hypothetical, based on the  $\text{Fe}_9\text{O}_6$  ring are shortly discussed.

## REFERENCE

Moore (P. B.), 1974. *Am. Mineral.* **59**, 48.

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## Metamorphism in a Himalayan thrust zone

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METAMORPHIC assemblages from the vicinity of a thrust in the Sikkim to Darjeeling area of the Himalayas contain some of the following minerals: quartz, plagioclase, epidote, sericite, lawsonite, chlorite, stilpnomelane, aragonite, phengite, and pumpellyite. Textural relationships suggest that stilpnomelane replaces pumpellyite and that both of these minerals are replaced by epidote. The assemblage lawsonite-quartz-aragonite appears to have been stable and indicates that a moderate- to high-pressure metamorphism developed coevally with the thrusting. The rocks involved are Proterozoic but it seems likely that the thrusting was Tertiary. The metamorphism associated with the thrusting may have outlasted a more general Tertiary metamorphism or may have been superimposed on a Precambrian event. Either way this is unusual for in general the stratigraphic age of rocks involved in such tectonic zones is not much greater than the age of the metamorphism.

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## Zoned amphibole in the Yirri intrusive complex, Manus Island, Papua, New Guinea

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FIVE representative probe analyses of zoned hornblendes in a dioritic suite and two rock analyses are tabulated and about sixty analysed hornblendes plotted to reveal petrogenetic relationships that are interpreted as showing that the brown amphibole cores are from a partially melted mafic source (base of the crust?) while the green margins have crystallized from the magma produced by partial melting.

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