Synthesis and Characterization of the Manganese Pyroarsenate
Mn$_2$As$_2$O$_7$ · 2 H$_2$O

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Pyroarsenate

The manganese pyroarsenate hydrate, Mn$_2$As$_2$O$_7$ · 2 H$_2$O, has been obtained as a single phase product using hydrothermal methods and the structure has been determined by single crystal X-ray diffraction. The title compound crystallizes in the monoclinic space group P2$_1/n$ with $a = 6.6576(4)$ Å, $b = 14.555(1)$ Å, $c = 7.8147(5)$ Å, $\beta = 94.935(1)^\circ$, $V = 754.46(8)$ Å$^3$ and $Z = 4$. The manganese ions are each coordinated to five oxygen atoms and a water molecule in a distorted octahedral arrangement. Edge-sharing MnO$_6$ octahedra form chains which are connected to a three-dimensional framework by As$_2$O$_7^{4-}$ ions. The pyroarsenate anion, which attains a nearly eclipsed conformation, has a mean As-O distance for the terminal As-O bonds of 1.669(2) Å, while for the bridging oxygen atom a mean value of 1.757(2) Å is observed. Magnetic susceptibility measurements indicate the presence of high-spin Mn$^{2+}$ ions. Thermogravimetric as well as IR and Raman spectroscopic studies of Mn$_2$As$_2$O$_7$ · 2 H$_2$O are presented.