

Synthesis and Characterization of $\text{Mn}_6(\text{PO}_4)_4 \cdot \text{H}_2\text{O}$, a New Metal(II) Phosphate Hydrate

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The new manganese phosphate hydrate, $\text{Mn}_6(\text{PO}_4)_4 \cdot \text{H}_2\text{O}$, 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 *Cc* with $a = 934.18(10)$, $b = 1743.68(18)$, $c = 815.15(8)$ pm, $\beta = 92.616(2)^\circ$, $V = 1326.4(2) \cdot 10^6$ pm³, $Z = 4$, and the refinement led to $R1 = 0.0281$ and $Rw2 = 0.0728$ (all data). The structure is composed of $[\text{PO}_4]$ and $[\text{MnO}_x]$ polyhedra ($x = 6, 7$) and might be described as a distorted primitive hexagonal packing of $[\text{PO}_4]$ tetrahedra which are held together by Mn^{2+} ions partially located in distorted trigonal prismatic positions. This leads to a dense three-dimensional framework structure. Magnetic susceptibility measurements verified the presence of high-spin Mn^{2+} ions and thermogravimetric data confirm the chemical composition deduced from the single crystal structure determination.