



>>Entry Name: Magnesium phosphate ($\text{Mg}_3(\text{PO}_4)_2$)

ENTRY UNDER REVIEW

Synonym(s): Magnesium phosphate (3:2), 9CI, 8CI, USAN. Magnesium orthophosphate. Phosphoric acid, magnesium salt (2:3), 8CI. Magnesium phosphate tribasic

CAS Registry Number: 7757-87-1

Related CAS Registry Numbers(s): 10233-87-1 53408-95-0

Extra CAS Registry Numbers(s): 10043-83-1

$\text{Mg}_3(\text{PO}_4)_2$

Molecular Formula: $\text{Mg}_3\text{O}_8\text{P}_2$

Molecular Weight: 262.858

Accurate Mass: 261.86197

Percentage Composition: Mg 27.74%; O 48.69%; P 23.57%

Source/Synthesis: Synth. from Mg aq. + Na_3PO_4 aq., or Na_2HPO_4 aq.

Use/Importance: Unlike hydrates does not exhibit ion-exchange props. Employed in cements, refractories, fertilisers and as catalysts and catalyst carriers. Antacid

Physical Description: Iridescent, orthorhombic cryst.

Melting Point: Mp 1348°

Solubility: Sol. acids; insol. H_2O

Other Data: $\Delta H_f^\circ -3775 \text{ kJ mol}^{-1}$; $\Delta G_f^\circ -3503 \text{ kJ mol}^{-1}$; $S^\circ 188 \text{ J K}^{-1} \text{ mol}^{-1}$

>>Derivative: Tetrahydrate

CAS Registry Number: 13465-22-0

Source/Synthesis: Said to be formed from Mg phosphates in soils

Solubility: Prac. insol. H_2O

Other Data: $\Delta H_f^\circ -4023 \text{ kJ mol}^{-1}$

>>Derivative: Pentahydrate

CAS Registry Number: 10233-87-1

Source/Synthesis: Synth. from $\text{Na}_2\text{HPO}_4 \cdot 2\text{H}_2\text{O}$ + $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$ + urea at pH >5.2

Other Data: Loses $3\text{H}_2\text{O}$ at 220°

>>Derivative: Heptahydrate

CAS Registry Number: 26062-72-6

Other Data: Loses 5 H_2O at 190° , and remainder of H_2O of cryst. at $\rightarrow 420^\circ$, ending at $440\text{-}530^\circ$

>>Derivative: Octahydrate

CAS Registry Number: 13446-23-6

Source/Synthesis: Formed in soln. from the docosahydrate at pH 9; or MgSO_4 + Na_2HPO_4 aq. at pH 6.5-7.0

Use/Importance: Commercially available

Physical Description: The most stable hydrate. Possesses nuclear coord. H_2O

Solubility: Prac. insol. (H_2O)

Other Data: Two kinds of cryst. lattice known, both monoclinic. H_2O molecules coord. by cation are non-equiv. Dehydrates in three stages at 110° , 280° and 370°

Fluka: 63132

>>Derivative: Decahydrate

CAS Registry Number: 10102-35-9

Source/Synthesis: Formed from the docosahydrate on long standing

Physical Description: Possesses nuclear coord. H_2O as well as H_2O of cryst.

Other Data: Said to occur in aq. solns.

>>Derivative: Docosahydrate

CAS Registry Number: 53408-95-0

Source/Synthesis: Synth. from MgO + $\text{MgHPO}_4 \cdot 3\text{H}_2\text{O}$ at pH 9; or MgCl_2 + Na_2HPO_4 aq. at pH 9 and $<50^\circ$

Use/Importance: Exhibits ion-exchange props.

Physical Description: Colourless plates. Possesses nuclear coord. H_2O as well as H_2O of cryst.

Other Data: Triclinic unit cell. P-O 153.9-154.9 pm, OPO 108.6-110.5°. Mg-O 205-210.6 pm. Stable in air, unstable in aq. $\rightarrow$ octahydrate. Vacuum drying removes 18 H_2O . Otherwise, 20 H_2O are lost at 150° and 1 H_2O at 280° . Completely dehydrates at $320\text{-}600^\circ$

Aldrich: 34470-2