



>>Entry Name: Manganese phosphides

Molecular Formula: [MnP]

>>Variant: Manganese phosphide (Mn₃P), 11Cl, 10Cl

CAS Registry Number: 12263-33-1

Molecular Formula: Mn₃P

Molecular Weight: 195.788

Accurate Mass: 195.787903

Percentage Composition: Mn 84.18%; P 15.82%

Source/Synthesis: Synth. from Mn and red P at 400° *in vacuo* for 48h then temp. slowly raised to 600° and maintained for 48h

Physical Description: Thin needles

Melting Point: Mp 1105° (incongr.)

Other Data: Antiferromagnetic, T_N 115 K, tetragonal and isomorphous with Fe₃P

>>Variant: Manganese phosphide (Mn₂P), 11Cl, 10Cl

CAS Registry Number: 12333-54-9

Molecular Formula: Mn₂P

Molecular Weight: 140.85

Accurate Mass: 140.849856

Percentage Composition: Mn 78.01%; P 21.99%

of one another. In the channels formed Mn atoms occupy alternately tetrahedral and pyramidal sites

Source/Synthesis: Synth. by heating Mn and red P *in vacuo* at 497°

Melting Point: Mp 1326-1327°

Solubility: Sol. molten alkali carbonate, nitrate, persulfate

Other Data: Isomorphous with hexagonal Fe₂P

Hazard & Toxicity: Vigorous reactions occur with oxidisers, e.g. Na₂O₂ or PbO₂

>>Derivative: Compound with arsenic

Synonym(s): Manganese arsenide phosphide

Source/Synthesis: Prepd. from Mn₂As and Mn₂P at 700-800° in evacuated quartz ampoules

Other Data: Non stoichiometric As_xMn₂P_{1-x}. Compounds exist in ranges 0 < x < 0.35 and 0.9 < 1. T_N 110K

>>Variant: Manganese phosphide MnP, 11Cl, 10Cl

CAS Registry Number: 12032-78-9

Molecular Formula: MnP

Molecular Weight: 85.912

Accurate Mass: 85.911809

Percentage Composition: Mn 63.95%; P 36.05%

Source/Synthesis: Synth. by electrolysis of melts containing Mn and P compds. Other methods include reaction of Mn + Ca₃P₂ at elevated temp.

Use/Importance: Metallic *p*-type conductor. Hardness roughly equivalent to high-carbon steel

Physical Description: Needles with a metallic appearance

Melting Point: Mp 1147 1193°

Solubility: Insol. H₂O; stable conc. HCl

Other Data: Has distorted orthorhombic NiAs struct. and several ordered magnetic phases

>>Variant: Manganese phosphide (MnP₃), 9Cl

CAS Registry Number: 51404-26-3

Molecular Formula: MnP₃

Molecular Weight: 147.859

Accurate Mass: 147.859333

Percentage Composition: Mn 37.16%; P 62.84%

Source/Synthesis: Synth. by heating Mn powder and red P at 625° for 30h and then 710° for 96h

Physical Description: Air-stable black powder

Solubility: Insol. aqua regia

Other Data: ΔH_{298}° -188 (-213) kJ mol⁻¹. On heating →MnP and P₄

>>Variant: Manganese phosphide (MnP₄), 10Cl