



>>Entry Name: Manganate(VI) ($\text{MnO}_4^{2(-)}$)

Synonym(s): Tetraoxomanganate(VI)(2-), 11Cl

CAS Registry Number: 14333-14-3

$[\text{MnO}_4]^{2(-)} (T_d)$

Molecular Formula: $\text{MnO}_4^{2(-)}$

Molecular Weight: 118.936

Accurate Mass: 118.917707

Percentage Composition: Mn 46.19%; O 53.81%

Source/Synthesis: Synth. by fusing MnO_2 with alkali metal hydroxides or by electrolytic oxidation of alkaline Mn(II) solns.

Use/Importance: Useful oxidant in synthetic org. chem.

Physical Description: Stable in aq. alkaline soln. $>1M [\text{OH}^{(-)}]$, disproportionates at lower pH to MnO_2 and $\text{MnO}_4^{(-)}$. Stable in KNO_2 or KNO_3 melts

Other Data: d^1 ion, μ_{eff} ca. $1.8\mu_B$. Ir $\nu_{\text{Mn-O}}$ 862 cm^{-1} (D_2O)

>>Derivative: Di-Na salt

Synonym(s): Sodium manganate(VI) (Na_2MnO_4)

CAS Registry Number: 15702-33-7

>>Derivative: Di-Na salt; decahydrate

Molecular Formula: $\text{H}_{20}\text{MnNa}_2\text{O}_{14}$

Molecular Weight: 345.067

Accurate Mass: 345.002891

Percentage Composition: H 5.84%; Mn 15.92%; Na 13.32%; O 64.91%

Physical Description: Green monoclinic cryst.

Melting Point: Mp 17°

Solubility: Sol. H_2O ; dec. in hot H_2O

>>Derivative: Di-K salt

Synonym(s): Potassium manganate(VI) (K_2MnO_4)

CAS Registry Number: 10294-64-1

Molecular Formula: K_2MnO_4

Molecular Weight: 197.132

Accurate Mass: 196.845121

Percentage Composition: K 39.67%; Mn 27.87%; O 32.46%

Source/Synthesis: Synth. by adding a mixture of KMnO_4 and KOH to H_2O in the absence of CO_2

Physical Description: Dark green cryst.

Melting Point: Mp $640-680\text{ dec.}^\circ$

Other Data: Mn-O_{av} 165.9 pm , $\mu_{\text{eff}} = 1.75\mu_B$ (298K). Isomorphous with K_2SO_4 and K_2CrO_4

>>Derivative: Ba salt

Synonym(s): Barium manganate (BaMnO_4)

CAS Registry Number: 7787-35-1

Molecular Formula: BaMnO_4

Molecular Weight: 256.263

Accurate Mass: 256.822939

Percentage Composition: Ba 53.59%; Mn 21.44%; O 24.97%

Source/Synthesis: Synth. by adding a soln. of $[\text{MnO}_4]^{(-)}$ to a soln. containing $\text{I}^{(-)}$ and $\text{Ba}(\text{OH})_2$

Physical Description: Green

Solubility: Insol. H_2O , disproportionates to MnO_2 and $\text{MnO}_4^{(-)}$ on contact with H_2O

Other Data: $\mu_{\text{eff}} = 1.80\mu_B$ (298K)

Aldrich: 21019-6

Fluka: 11786

>>Derivative: Di-Ag salt

Synonym(s): Silver(I) manganate(VI) (Ag_2MnO_4)