



>>Entry Name: Manganese(IV) oxide (MnO₂)

Synonym(s): Manganese dioxide, 11Cl

CAS Registry Number: 1313-13-9

Related CAS Registry Numbers(s): 12174-34-4 12424-16-7 63194-12-7

MnO₂

Molecular Formula: MnO₂

Molecular Weight: 86.937

Accurate Mass: 86.927877

corresponds to MnO₂. The term '*Braunstein*' refers to phases of composition MnO_{1.7} - MnO_{2.0}

Use/Importance: Many uses e.g. positive electrode in Leclanché dry cells; oxygen source in welding, safety matches, explosives and fireworks; additive in glasses and cements; ion-exchangers in H₂O; catalyst for oxidation of CO to CO₂; removes SO₂ and Cl₂ from air; oxidising agent in org. chem.; potential use as secondary component in optical switching device

Physical Description: Inert to most acids except when heated whence it functions as an oxidising agent. With conc. HCl, Cl₂ is evolved. With H₂SO₄ at 100° O₂ is evolved and an Mn(III) acid sulfate is formed

Hazard & Toxicity: LD₅₀ (mus, scu) 422 mg/kg

Aldrich: 24344-2

Fluka: 63553

Sigma: M8886

>>Variant: α-form

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Source/Synthesis: Synth. by reduction of KMnO₄ with H₂O₂ or HCl and isolated in the presence of a large cation

Use/Importance: Exhibits cation exchange behaviour. Ag⁽⁺⁾ ions enter struct. more readily than the larger Pb²⁽⁺⁾ or Ba²⁽⁺⁾

Other Data: The minerals Hollandite, Cryptomelane and Coronadite and α-MnO₂ form an isostructural series of formula A_{2-y}B_{8-z}X₁₆ where A = Ba²⁽⁺⁾, Pb²⁽⁺⁾, K⁽⁺⁾; B = Mn⁴⁽⁺⁾, Mn²⁽⁺⁾, Fe²⁽⁺⁾; X = O²⁽⁻⁾ or OH⁽⁻⁾, y varies from 0.8-1.3, z varies from 0.1-0.5. In the structures Mn⁴⁽⁺⁾ ions in a MnO₂ framework are replaced by Mn²⁽⁺⁾ ions with positive ions e.g. Ba²⁽⁺⁾ or K⁽⁺⁾ in the interstices

>>Derivative: Mineral

Synonym(s): Hollandite

CAS Registry Number: 63800-42-0

Molecular Formula: BaMn₈O₁₆

Molecular Weight: 832.821

Accurate Mass: 833.328248

Percentage Composition: Ba 16.49%; Mn 52.77%; O 30.74%

Source/Synthesis: Occurs in e.g. Nevada, Sweden, Germany, India

Physical Description: Black, to silvery-grey cryst.

Other Data: Monoclinic. Formulated as Ba(Mn⁴⁽⁺⁾, Mn²⁽⁺⁾, Fe³⁽⁺⁾)₈O₁₆

>>Derivative: Mineral

Synonym(s): Romanechite. Psilomelane

CAS Registry Number: 12260-01-4

Source/Synthesis: Formed by weathering of Mn carbonate or silicate rocks. Occurs widespread assoc. with Pyrolusite in e.g. USA

Physical Description: Black to steel grey opaque cryst.; monoclinic

Other Data: Formulated as Ba(Mn₉O₁₈).2H₂O. Forms Hollandite at 550°. Psilomelane is the group name and general term for unspecified Mn ores

>>Derivative: Mineral

Synonym(s): Cryptomelane