



>>Entry Name: **Molybdenum(VI) oxide (MoO<sub>3</sub>)**

**Synonym(s):** Molybdenum trioxide. Molybdic oxide. Molybdic anhydride

**CAS Registry Number:** 1313-27-5

**Related CAS Registry Numbers(s):** 11098-99-0

MoO<sub>3</sub>

**Molecular Formula:** MoO<sub>3</sub>

**Molecular Weight:** 143.938

**Accurate Mass:** 145.890151

**Percentage Composition:** Mo 66.65%; O 33.35%

**Source/Synthesis:** Synth. by roasting MoS<sub>2</sub> in air; purif. by subl.

**Use/Importance:** MoO<sub>3</sub> and more basic metal oxides are used as heterogeneous catalysts. Used in fertilizer. *n*-Type semiconductor. Commercially available

**Physical Description:** Photosensitive. White solid. Acidic oxide

**Melting Point:** Mp 795° (801°)

**Solubility:** Spar. sol. H<sub>2</sub>O; sol. aq. alkalis, NH<sub>3</sub>

**Other Data:** Weakly paramagnetic. On heating Mo and MoO<sub>3</sub> *in vacuo* a number of sub-stoichiometric oxides are formed typically having shear-structs, and forming series including Mo<sub>n</sub>O<sub>3n-1</sub>

**Aldrich:** 20381-5

**Fluka:** 69850

**Sigma:** M2277

>>Variant: Mineral-form

**Synonym(s):** Molybdate

**Molecular Formula:** MoO<sub>3</sub>

**Molecular Weight:** 143.938

**Accurate Mass:** 145.890151

**Percentage Composition:** Mo 66.65%; O 33.35%

**Source/Synthesis:** Occurs in quartz with molybdenite (MoS<sub>2</sub>) in Czechoslovakia

**Physical Description:** Light greenish yellow to colourless transparent needles or plates

>>Variant: **Molybdenum(V) oxide (Mo<sub>2</sub>O<sub>5</sub>)**

**Synonym(s):** Dimolybdenum pentoxide. Shear phase

**CAS Registry Number:** 12163-73-4

**Molecular Formula:** Mo<sub>2</sub>O<sub>5</sub>

**Molecular Weight:** 271.877

**Accurate Mass:** 275.785387

**Percentage Composition:** Mo 70.58%; O 29.42%

**Source/Synthesis:** Synth. by heating a mixture of Mo and MoO<sub>3</sub> in stoichiometric quantities at 750°

**Physical Description:** Violet solid

**Solubility:** Sol. warm acids

>>Variant: **Molybdenum oxide (Mo<sub>4</sub>O<sub>11</sub>)**

**Synonym(s):** Shear phase

**CAS Registry Number:** 12033-38-4

**Molecular Formula:** Mo<sub>4</sub>O<sub>11</sub>

**Molecular Weight:** 559.753

**Accurate Mass:** 567.565689

**Percentage Composition:** Mo 68.56%; O 31.44%

**Physical Description:** Oxidised in air between 230-350°

**Solubility:** Insol. non-oxidising aq. acids, alkalis

>>Derivative: Monoclinic-form

**Source/Synthesis:** Obt. below 615° by heating Mo + MoO<sub>3</sub> *in vacuo*

**Physical Description:** Wine-red cryst.

>>Derivative: Monoclinic-form (isotype)