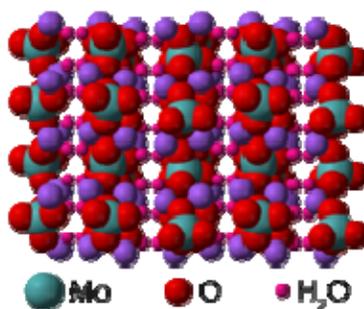
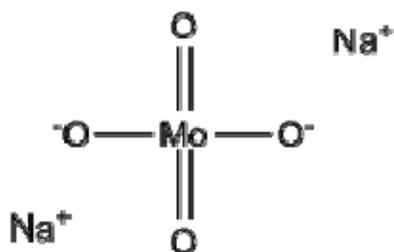
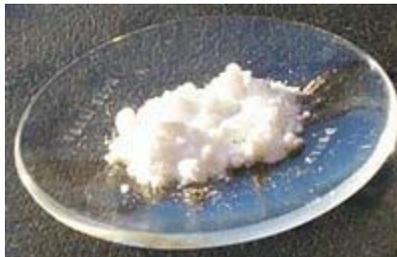


# Sodium molybdate

## Sodium molybdate



IUPAC name

Other names

Disodium molybdate

### Identifiers

CAS number

[7631-95-0],  
10102-40-6 (dihydrate)

PubChem	4384450
EC number	231-551-7
RTECS number	QA5075000
<b>Properties</b>	
Molecular formula	Na <sub>2</sub> MoO <sub>4</sub>
Molar mass	205.92 g/mol (anhydrous) 241.95 g/mol (dihydrate)
Appearance	White powder
Density	3.78 g/cm <sup>3</sup> , solid
Melting point	687 °C
Solubility in water	84 g/100 ml (100 °C)
Refractive index ( <i>n<sub>D</sub></i> )	1.714
<b>Hazards</b>	
MSDS	External MSDS
EU Index	Not listed
NFPA 704	 <div style="text-align: right; margin-right: 50px;"> 0 2 0 </div>
Flash point	Non-flammable
<b>Related compounds</b>	
Other anions	Sodium chromate Sodium tungstate
Other cations	Ammonium molybdate

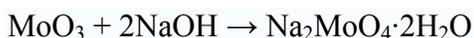
Except where noted otherwise, data are given for materials in their standard state (at 25 °C, 100 kPa)  
Infobox references

**Sodium molybdate**, Na<sub>2</sub>MoO<sub>4</sub>, is useful as a source of molybdenum.<sup>[1]</sup> It is often found as the dihydrate, Na<sub>2</sub>MoO<sub>4</sub>·2H<sub>2</sub>O.

The molybdate(VI) anion is tetrahedral. Two sodium cations coordinate with every one anion.<sup>[2]</sup>

## History

Sodium molybdate was first synthesized by the method of hydration.<sup>[3]</sup> A more convenient synthesis is done by dissolving [MoO<sub>3</sub>](#) in sodium hydroxide at 50–70 °C and crystallizing the filtered product.<sup>[2]</sup> The anhydrous salt is prepared by heating to 100 °C.



## Uses

The agriculture industry uses 1 million pounds per year as a fertilizer. In particular, its use has been suggested for treatment of whiptail in broccoli and cauliflower in molybdenum-deficient soils.<sup>[4][5]</sup> However, care must be taken because at a level of 0.3 ppm sodium molybdate can cause copper deficiencies in animals, particularly cattle.<sup>[2]</sup>

It is used in industry for corrosion inhibition, as it is a non-oxidizing anodic inhibitor.<sup>[2]</sup> The addition of sodium molybdate significantly reduces the nitrite requirement of fluids inhibited with nitrite-amine, and improves the corrosion protection of carboxylate salt fluids.<sup>[6]</sup>

## Reactions

When reacted with sodium borohydride, molybdenum is reduced to a lower valent oxide:<sup>[7]</sup>



Sodium molybdate reacts with the acids of dithiophosphates:<sup>[2]</sup>



which further reacts to form [MoO<sub>3</sub>(S<sub>2</sub>P(OR)<sub>2</sub>)<sub>4</sub>].

## Safety

Sodium molybdate is incompatible with alkali metals, most common metals and oxidizing agents. It will explode on contact with molten magnesium. It will violently react with interhalogens (e.g., bromine pentafluoride; chlorine trifluoride). Its reaction with hot sodium, potassium or lithium is incandescent.<sup>[*citation needed*]</sup>

## See also

- xanthine oxidase

## References

1. <sup>^</sup> Greenwood, Norman N.; Earnshaw, A. (1984), *Chemistry of the Elements*, Oxford: Pergamon, ISBN 0-08-022057-6
2. <sup>^</sup> <sup>[a](#)</sup> <sup>[b](#)</sup> <sup>[c](#)</sup> <sup>[d](#)</sup> <sup>[e](#)</sup> Braithwaite, E.R.; Haber, J. *Molybdenum: An outline of its Chemistry and Uses*. 1994. Elsevier Science B.V. Amsterdam, The Netherlands.
3. <sup>^</sup> Spitsyn, Vikt. I.; Kuleshov, I. M. *Zhurnal Obshchei Khimii* 1951. 21. 1701-15.
4. <sup>^</sup> Plant, W. (1950). "Use of Lime and Sodium Molybdate for the Control of 'Whiptail' in Broccoli". *Nature* **165**: 533. doi:10.1038/165533b0.
5. <sup>^</sup> Davies, E. B. (1945). "A Case of Molybdenum Deficiency in New Zealand". *Nature* **156**: 392. doi:10.1038/156392b0.
6. <sup>^</sup> Vukasovich, Mark S. *Lubrication Engineering* 1980. 36(12). 708-12.
7. <sup>^</sup> Chi Fo Tsang and Arumugam Manthiram. *Journal of Materials Chemistry* 1997. 7(6). 1003–1006.