

# Molybdenum

Atomic number 42  
Atomic weight 95.94

## Collection

Serum/Plasma 2 mL Plastic tube. No anticoagulant  
Urine 20 mL Sterile Universal

## Reference ranges

			Reference
Serum/plasma	nmol/L	4 - 12	1
Blood	nmol/L	Less than 10	1-3
Urine	µmol/L	1.2	
	nmol/24 h		4,5
	µmol/mol creatinine	106.5 95th percentile	5

## References

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3. Changa F-H, Wang S-L, Huang Y-L et al. Biomonitoring of chromium for residents of areas with a high density of electroplating factories. *J Exposure Science Environmental Epidemiology* 2006 **16**, 138–146
4. Hoet P, Jaquerye C, Deumer G, Lison D, Haufroid V. Reference values and upper reference limits for 26 trace elements in the urine of adults living in Belgium. *Clin. Chem. Lab. Med.* 2013; 51: 839-849
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## Clinical

Molybdenum is used in many industrial processes, mainly as a component of stainless steels and other alloys. It is used in the chromium-cobalt alloy used for orthopaedic implants.

## Biological Function

Molybdenum is an essential trace element and has several functions. In bacteria it is a component of several nitrogenases. In animals it is a cofactor of xanthine oxidase, metabolising xanthine to uric acid. The most important role is a molybdenum cofactor, a complex of molybdopterin with molybdenum, which is essential for sulphite oxidase, xanthine oxidoreductase and aldehyde oxidase. Molybdenum cofactor deficiency can cause severe neurological abnormalities and death. Deficiency cannot be detected by measuring molybdenum concentrations.

**Deficiency**

Molybdenum deficiency is rare in most populations, but there are parts of the world with low endogenous molybdenum intake and reduced intake has been associated with oesophageal cancer in China. There have been rare reports of molybdenum deficiency associated with TPN, with increased concentrations of sulphite and urate.

**Toxicity**

High concentrations of molybdenum will interfere with copper absorption and metabolism and can cause copper deficiency. Tetrathiomolybdate is used as a treatment for Wilson's Disease. Exposure to molybdenum dust can cause irritation to eyes, sinuses and skin.

**Laboratory measurements**

Molybdenum can be measured in blood, serum or urine. Apart from occupational exposure there are few indications for measuring molybdenum concentrations. There is no value in measuring molybdenum in patients with orthopaedic implants.

**References**

Barceloux, DG, Molybdenum. J Toxicology-Clinical Toxicology, 1999, 37, 231-237.