

Edition: BP 2025 (Ph. Eur. 11.6 update)

## Copper Sulfate



### [General Notices](#)

Anhydrous Copper Sulfate

Anhydrous Copper Sulphate

(*Ph. Eur. monograph 0893*)

CuSO<sub>4</sub> 159.6 7758-98-7

### Action and use

Used in treatment of copper deficiency.

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## DEFINITION

### Content

99.0 per cent to 101.0 per cent (dried substance).

## CHARACTERS

### Appearance

Greenish-grey powder, very hygroscopic.

### Solubility

Freely soluble in water, slightly soluble in methanol, practically insoluble in ethanol (96 per cent).

## IDENTIFICATION

- A. Add several drops of [dilute ammonia R2](#) to 1 mL of solution S (see Tests). A blue precipitate is formed. On further addition of [dilute ammonia R2](#) the precipitate dissolves and a dark blue colour is produced.
- B. Loss on drying (see Tests).
- C. Dilute 1 mL of solution S to 5 mL with [water R](#). The solution gives reaction (a) of sulfates ([2.3.1](#)).

## TESTS

### Solution S

Dissolve 1.6 g in [water R](#) and dilute to 50 mL with the same solvent.

### Appearance of solution

Solution S is clear ([2.2.1](#)).

### Chlorides ([2.4.4](#))

Maximum 150 ppm.

Dilute 10 mL of solution S to 15 mL with [water R](#).

### Iron

Maximum 150 ppm.

Atomic absorption spectrometry ([2.2.23, Method I](#)).

*Test solution* Dissolve 0.32 g in 10 mL of [water R](#), add 2.5 mL of [lead-free nitric acid R](#) and dilute to 25.0 mL with [water R](#).

*Reference solutions* Prepare the reference solutions using [iron standard solution \(20 ppm Fe\) R](#), adding 2.5 mL of [lead-free nitric acid R](#) and diluting to 25.0 mL with [water R](#).

*Source* Iron hollow-cathode lamp.

*Wavelength* 248.3 nm.

*Atomisation device* Air-acetylene flame.

*Copper may form explosive acetylides with acetylene. Therefore, clean the burner thoroughly before any residues become dry.*

### Lead

Maximum 5 ppm.

Atomic absorption spectrometry ([2.2.23, Method I](#)).

*Test solution* Dissolve 1.6 g in 10 mL of [water R](#), add 2.5 mL of [lead-free nitric acid R](#) and dilute to 25.0 mL with [water R](#).

*Reference solutions* Prepare the reference solutions using [lead standard solution \(100 ppm Pb\) R](#), adding 2.5 mL of [lead-free nitric acid R](#) and diluting to 25.0 mL with [water R](#).

*Source* Lead hollow-cathode lamp.

*Wavelength* 217.0 nm.

*Atomisation device* Air-acetylene flame.

*Copper may form explosive acetylides with acetylene. Therefore, clean the burner thoroughly before any residues become dry.*

### [Loss on drying \(2.2.32\)](#)

Maximum 1.0 per cent, determined on 0.500 g by drying in an oven at  $250 \pm 10$  °C.

## ASSAY

Dissolve 0.125 g in 50 mL of [water R](#). Add 2 mL of [sulfuric acid R](#) and 3 g of [potassium iodide R](#). Titrate with [0.1 M sodium thiosulfate](#), using 1 mL of [starch solution R](#), added towards the end of the titration.

1 mL of [0.1 M sodium thiosulfate](#) is equivalent to 15.96 mg of  $\text{CuSO}_4$ .

## STORAGE

In an airtight container.

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