

Copper – Bathocuproine Method

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Applications and Industries

Drinking water, groundwater, surface waters, domestic and industrial wastewaters, seawater

References

APHA Standard Methods, 23rd ed., Method 3500-Cu C - 1999

Chemistry

In a neutral solution, cupric copper is reduced to cuprous with sodium bisulfite. Cuprous ions react with bathocuproine (2,9-dimethyl-4,7-diphenyl-1,10-phenanthrolinedisulfonic acid, disodium salt) to form an orange colored chelate in direct proportion to the copper concentration. Results are expressed in ppm (mg/L) Cu.

Available Analysis Systems

Visual colorimetric: CHEMets®

Instrumental colorimetric: Vacu-vials®

Storage Requirements

Products should be stored in the dark and at room temperature. Precipitation of this reagent is accelerated by even short exposure to heat.

Shelf Life

When stored in the dark and at room temperature:

Visual colorimetric:

CHEMets refill, color comparators: at least 1 year

Instrumental colorimetric:

Vacu-vials kit: at least 1 year

Safety Information

Safety Data Sheets (SDS) are available upon request and at www.chemetrics.com. Read SDS before using these products. Breaking the tip of an ampoule in air rather than water may cause the glass ampoule to shatter. Wear safety glasses and protective gloves.

Interference Information

- This chemistry measures fully ionized solubilized copper. It does not measure suspended, insoluble particulate copper, copper attached to large organic molecules, or chelated copper.
- EDTA and cyanide will interfere by forming complexes with copper, causing low test results.
- Thiocyanate may interfere.
- Persulfate does not interfere at levels up to 10,000 ppm.
- Nitrite up to 5000 ppm does not interfere.
- The reagent is applicable to the analysis of seawater. The color development time should be decreased to 1 minute (rather than 2 minutes) in order to minimize formation of a precipitate in the test ampoule during seawater analysis.
- The unused reagent may precipitate with time. However, the precipitate typically dissolves upon introduction of sample into the test ampoule and does not interfere.
- Sample pHs between 3 and 8 are tolerated. Samples with extreme pHs or that are highly buffered may overcome the buffering capacity of the reagent. When necessary, adjust sample pH to 6-7 prior to analysis.
- Sample color or turbidity may make a color match difficult during visual colorimetric testing and may cause a false positive result with instrumental colorimetric tests. CHEMetrics' Sample Zeroing Accessory Pack can be used to correct for potential errors during instrumental analysis.

Accuracy Statement

Statements of accuracy are based on laboratory tests performed under ideal testing conditions using standards of known concentration prepared in deionized water.

CHEMets kit: ± 1 color standard increment

Vacu-vials kit:

With a spectrophotometer:

- ≤ 0.07 ppm at 0 ppm
- ± 0.08 ppm at 0.25 ppm
- ± 0.50 ppm at 2.50 ppm
- ± 0.53 ppm at 5.25 ppm

With V-2000 and V-3000:

- ≤ 0.13 ppm at 0 ppm
- ± 0.15 ppm at 0.50 ppm
- ± 0.50 ppm at 2.50 ppm
- ± 0.90 ppm at 9.00 ppm