

Molybdate - Catechol Method

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Applications and Industries

Industrial water treatment, power generation, cooling water systems

References

G.P. Haight and V. Paragamian, Analytical Chemistry, pp. 32, 642 (1960)

H. Onishi and E. B. Sandell, Photometric Determination of Trace Metals, 4th ed., Part I, p. 295 (1978)

Chemistry

In a mildly reducing solution, catechol reacts with hexavalent molybdenum to form a yellow-orange colored chelate in direct proportion to the hexavalent molybdenum concentration. Test results are expressed as ppm (mg/L) molybdenum (Mo). To convert results to ppm molybdate (MoO_4^{2-}), multiply test result by 1.67.

Available Analysis Systems

Instrumental colorimetric: Vacu-Vials®

Visual colorimetric: CHEMets®

Storage Requirements

Products should be stored in the dark and at room temperature.

Shelf Life

When stored in the dark and at room temperature:

Instrumental colorimetric:

Vacu-vials kit: at least 1 year

Visual colorimetric:

CHEMets refill, color comparators: 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

- Molybdate itself at concentrations above the test range may develop an orange-red color with this reagent.
- Ferrous iron will cause low and sometimes off-color test results.
- Ferric iron interferes by developing a red or violet color.
- Nitrite up to at least 20 ppm as $\text{NO}_2\text{-N}$ does not interfere.
- Calcium chloride up to at least 32% does not cause an interference.
- Ethylene glycol up to 50% does not interfere significantly.
- Propylene glycol at 50% may cause a slightly low bias.
- Samples that have extreme pHs or that are highly buffered should be adjusted to near neutral pH 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.

Vacu-vials kit:

With Spectrophotometers and V-3000:

- ≤ 0.63 ppm at 0 ppm
- ± 1.0 ppm at 2.5 ppm
- ± 1.2 ppm at 6.0 ppm
- ± 1.9 ppm at 19.0 ppm

With V-2000:

- ≤ 0.63 ppm at 0 ppm
- ± 1.0 ppm at 2.5 ppm
- ± 1.2 ppm at 6.0 ppm
- ± 2.9 ppm at 19.0 ppm

CHEMets kit: ± 1 color standard increment