

Zinc - Zincon Method

Version 5 / Jun 2023

Applications and Industries

Potable water, purified wastewater effluent

References

APHA Standard Methods, 23rd ed., Method 3500-Zn B - 1997
ASTM D 1691-84, Zinc in Water, Test Method A

Chemistry

In an alkaline solution, dissolved zinc reacts with zincon (2-carboxy-2'-hydroxy-5'-sulfoformazyl benzene) to produce a blue colored complex in direct proportion to the dissolved zinc concentration. Results are expressed as ppm (mg/L) Zn.

To obtain test results for total acid-extractable zinc, the sample must be pre-treated prior to analysis as described in the Test Method section of the kit instructions.

Available Analysis Systems

Instrumental colorimetric: Vacu-vials®

Storage Requirements

Products should be stored in the dark and at room temperature. Exposure to extreme temperatures or light will cause the indicator solution (Cat. No. A-9900) to expire prematurely. Use of expired solution causes low test results.

Shelf Life

When stored in the dark and at room temperature:

Instrumental colorimetric:

Vacu-vials kits: at least 8 months

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 K-9903:

- ≤ 0.08 ppm at 0 ppm
- ± 0.09 ppm at 0.30 ppm
- ± 0.15 ppm at 0.75 ppm
- ± 0.23 ppm at 2.25 ppm

Vacu-vials kit K-9923:

- ≤ 0.4 ppm at 0 ppm
- ± 0.5 ppm at 1.5 ppm
- ± 0.8 ppm at 3.8 ppm
- ± 1.1 ppm at 11.3 ppm

Interference Information

- Many metals other than zinc, including copper, nickel, cobalt, mercury, cadmium, chromium, aluminum, and iron react with zincon to cause positive interferences. The effect of many of these metallic ions can be prevented by pretreatment with cyanide followed by cyclohexanone. In order to minimize interferences due to manganese, sodium ascorbate can be added to the sample. CHEMetrics' zinc test kits do not contain the reagents necessary to perform these pretreatments.
- Chromate at concentrations greater than 50 mg/L may interfere.
- Magnesium, calcium, and sodium do not interfere.
- Anions normally present in industrial waters and wastewaters, including phosphate, sulfate and chloride, should not interfere.
- The solubility of zinc is pH dependent. At pHs of approximately 8 and above, zinc drops out of solution. Once the zinc has precipitated, it will not be measured with this kit unless the sample is pretreated for total zinc analysis. The pH of the sample is also significant with respect to proper color development with the test kit chemistry. Samples with pHs below approximately 3 may not develop color properly; pH should be adjusted to between 3 and 7. However, the pH must not be adjusted above 7; otherwise, the zinc will begin to drop out of solution.
- Zinc chelated with EDTA is not measured quantitatively with this test.
- 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 with CHEMetrics photometers to correct for potential errors during instrumental analysis.

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.