

### 14.1.03

#### AOAC Official Method 983.24 Copper in Serum

Atomic Absorption Spectrophotometric Method  
First Action 1983  
Final Action 1986

##### A. Principle

Serum is diluted with H<sub>2</sub>O, and Cu is determined by AAS using standard solutions prepared in 10% glycerol.

##### B. Apparatus and Reagents

(a) *Atomic absorption spectrophotometer.*—Equipped with nebulizer and air-C<sub>2</sub>H<sub>2</sub> burner head. Monitor performance by assuring that 4.0 mg Cu/L standard produces response 0.200 absorbance unit.

(b) *External control.*—NIST SRM or commercially available serum control with an established value for Cu. Dilute according to label.

(c) *Glycerol USP.*—10% (v/v) aqueous solution.

(d) *Copper standard solutions.*—(1) *Stock standard solution.*—1000 mg Cu/L. Dissolve 1.000 g Cu metal in minimum volume of HNO<sub>3</sub> (1 + 1). Dilute to 1000 mL with 1% HNO<sub>3</sub>. (2) *Intermediate standard solution.*—100 mg/L. Dilute 10 mL stock

standard solution to 100 mL with H<sub>2</sub>O. (3) *Working standard solutions.*—Dilute 0.0, 0.25, 0.5, 1.0, 2.0, and 4.0 mL intermediate standard solution to 100 mL with 10% glycerol to give standard solutions containing 0.0, 0.25, 0.5, 1.0, 2.0, and 4.0 mg Cu/L.

##### C. Preparation of Test Solution

Rinse all glassware used with 2M HCl. Mix sera thoroughly before pipetting. Using Mohr pipet, transfer 1.0 mL serum and 1.0 mL external control to separate test tubes. Add 1.0 mL H<sub>2</sub>O to each and mix 5 s on Vortex mixer or cap tubes and shake 10 s. Use one external control for each 10 sera or fraction thereof.

##### D. Determination

Analyze by AAS using the following conditions: wavelength 324.7 nm; slit 0.7 nm; flame air-C<sub>2</sub>H<sub>2</sub> (lean-blue). Aspirate series of working standard solutions, external control solution, and test solution dilutions. Repeat analysis if Cu value in external control solution is not within accepted range. Prepare standard curve of concentration, mg Cu/L, vs *A*, and determine concentration of diluted serum. Multiply result by 200 to account for analyte dilution and to convert result to mg Cu/100 mL.

Reference: *JAOAC* **66**, 1140(1983).

CAS-7440-50-8 (copper)