

Copper (Colorimetric)

REF : COP-MC-0225 (2x25ml) COP-MC-0620(6x20ml)
COP-MC-0420 (4x20ml)

Intended Use

NS Biotec Copper reagent is intended for in-vitro quantitative, diagnostic determination of Copper in human serum, plasma or urine on both manual and automated systems.

Background

Copper (Cu) is an important trace element and is associated with a number of metalloproteins and it is a catalytic component of numerous enzymes and also a structural component of other important proteins. Copper is involved in many vital processes in the body; energy production, connective tissue formation, iron metabolism, melanin synthesis, normal function of CNS, regulation of gene expression and has antioxidant function. Excess Cu ingestion interfere with absorption of zinc and can lead to Zinc deficiency, which is frequently characterized by slow healing. The classical presentation of Cu toxicosis is represented by the genetic disease of Cu accumulation known as Wilson's disease. This disease is typified by hepatocellular damage (increased transferase) and/or changes in mood and behavior because of accumulation of Cu in Central Neurons.

Method

Colorimetric with Dibromo-PAESA

Assay Principle

Copper forms with 4-(3,5-dibromo-2-pyridylazo)-N-ethyl-sulfopropylaniline a chelate complex. The increase of absorbance of this complex can be measured and is proportional to the concentration of total copper in the sample.

Reagents

| | |
|---|-------------|
| Standard (ST) | |
| 100 µg/dL | 15.7 µmol/L |
| R (Monoreagent) | |
| Acetate buffer pH 5.0 | 0.2 mol/L |
| 4-(3,5-dibromo-2-pyridylazo)-N-ethyl-sulfopropylaniline | 0.02 mmol/L |

For further information, refer to the Copper reagent material safety data sheet.

Precautions and Warnings

Do not ingest or inhale. In case of contact with eyes or skin; rinse immediately with plenty of soap and water. In case of severe injuries; seek medical advice immediately.

Avoid contamination by using clean laboratory material (pipette, plastic vial for analyzers,...)

Reagent Preparation, Storage and Stability

Warning: The reagent could precipitate during refrigeration. It is suggested to let it to redissolve at room temperature before use (15 minutes). Mix well after redissolving.

NS BIOTEC Copper reagent is supplied ready-to-use and stable up to the expiry date labeled on the bottles. Once opened, the opened vial is stable for 3 months at 2-8 °C.

Specimen collection and preparation

Serum, Plasma (free from haemolysis)

24 hours Urine:

Refrigerate or add 10 ml of 3 mol/L HCl to the container before collection.

System Parameters

| | |
|-----------------|--------------------------|
| Wavelength | 580 nm (Hg 578) |
| Optical path | 1 cm |
| Assay type | End-point |
| Direction | Increase |
| Temperature | 37 °C |
| Zero adjustment | Reagent blank |
| Linearity | 500 µg/dl (78.65 µmol/l) |

Procedure

Determination of copper in serum

| | Blank | Standard | Sample |
|----------|--------|----------|--------|
| Reagent | 1.0 ml | 1.0 ml | 1.0 ml |
| Standard | ..... | 50 µl | ..... |
| Sample | ..... | ..... | 50 µl |

Mix and incubate for 5 minutes at 37 °C. Measure the absorbance of the sample A_s and of the standard A_{st} against the reagent blank A_{RBL} .

$$\Delta A_s = A_s - A_{RBL}$$

$$\Delta A_{std} = A_{std} - A_{RBL}$$

$$\text{Serum Copper conc. (mg/dL)} = \frac{\Delta A_s}{\Delta A_{std}} \times 100$$

$$\text{Serum Copper conc. (µmol/L)} = \frac{\Delta A_s}{\Delta A_{std}} \times 15.7$$

Determination of copper in urine

Dilute Standard 10 Times (Example: 100 µl standard + 900 µl normal saline), then follow the method below :

| | Blank | Standard | Urine Sample |
|------------------|-------|----------|--------------|
| Reagent | ..... | 1.0 ml | 1.0 ml |
| Diluted standard | ..... | 750 µl | ..... |
| Standard | ..... | ..... | 750 µl |
| Sample | 1.0ml | ..... | ..... |

Mix and incubate for 5 minutes at 37 °C. Measure the absorbance of the sample A_s and of the standard A_{st} against the blank A_{RBL} .

$$\Delta A_s = A_s - A_{RBL}$$

$$\Delta A_{std} = A_{std} - A_{RBL}$$

Calculation

$$\text{Urine Copper conc. } (\mu\text{g/dL}) = \frac{\Delta\text{As}}{\Delta\text{Astd}} \times 10$$

$$\text{Urine Copper conc. } (\mu\text{mol/l}) = \frac{\Delta\text{As}}{\Delta\text{Astd}} \times 1.57$$

$$\text{Copper conc. } (\mu\text{g/urine 24h}) = \frac{\Delta\text{As}}{\Delta\text{Astd}} \times 10 \times \text{dl of urine 24h}$$

Quality Control

Normal & abnormal commercial control serum of known concentrations should be analyzed with each run.

Linearity

The reaction is linear up to a Copper concentration of 500 $\mu\text{g/dl}$

(78.65 $\mu\text{mol/l}$)

Specimens showing higher concentration should be diluted 1+1 using physiological saline and repeat the assay (result \times 2).

Interfering Substances

Interferences are found according to the literatures.

Expected Values

In Serum

| | | |
|-----------------------|----------------------------|----------------------------------|
| Adult males | 70 - 140 $\mu\text{g/dl}$ | (11 - 22 $\mu\text{mol/l}$) |
| Adult females | 80 - 155 $\mu\text{g/dl}$ | (12.5 - 24.3 $\mu\text{mol/l}$) |
| Females in pregnancy | 120 - 300 $\mu\text{g/dl}$ | (18.8 - 47 $\mu\text{mol/l}$) |
| Children (6-12 years) | 80 - 190 $\mu\text{g/dl}$ | (12.5 - 29.8 $\mu\text{mol/l}$) |
| Infants | 20 - 70 $\mu\text{g/dl}$ | (3.14 - 11 $\mu\text{mol/l}$) |










In 24hours Urine 10 - 50 $\mu\text{g}/24\text{hours}$

Waste Disposal

This product is made to be used in professional laboratories. Please consult local regulations for a correct waste disposal.

References

1. Abe A., Yamashita S., Noma A., Clin. Chem., 552-554-35 (1989)
2. Richmond. N., Clin. Chem. 1973; 19: 1350-1356.

| | |
|--|---|
|  | Consult Instruction for Use |
|  | Caution Consult Accompanying Documents |
|  | In Vitro Diagnostic Medical Device |
|  | Temperature Limitation |
|  | Manufacturer |
|  | Authorized Representative In The European Community |
|  | Catalogue Number |
|  | Batch Code |
|  | Use By |

| | |
|--|--|
|  N.S BIOTEC MEDICAL EQUIPMENTS 66 Port Said St., Camp Shezar Alexandria – Egypt Tele: 002 03 592 0902 Fax : 002 03 592 0908 Website : www.nsbiotec.com E- mail : info@nsbiotec.com |   CMC Medical Devices & Drugs S.L. C/ Horacio Lengo, 18. 29006. Málaga, Spain |
|--|--|