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**Lab Dept:** Chemistry

**Test Name:** COPPER, SERUM

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***General Information***

**Lab Order Codes:** COPP

**Synonyms:** Cu, blood

**CPT Codes:** 82525 - Copper

**Test Includes:** Copper level reported in mcg/dL.

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***Logistics***

**Test Indications:** Useful for diagnosis of Wilson's disease, primary biliary cirrhosis (PBC) and primary sclerosing cholangitis (PSC).

In normal serum, more than 95% of the copper is incorporated into the enzyme, ceruloplasmin; the remaining copper is loosely bound to albumin. A deficiency in copper results in severe derangement in growth and metabolism and impairment of erythropoiesis.

**Lab Testing Sections:** Chemistry - Sendouts

**Referred to:** Mayo Clinic Laboratories (MML Test: CUS1)

**Phone Numbers:** MIN Lab: 612-813-6280

STP Lab: 651-220-6550

**Test Availability:** Daily, 24 hours

**Turnaround Time:** 1 - 3 days; performed Monday-Saturday

**Special Instructions:** See [Container](#) and [Collection](#) and [Patient Preparation](#) for special requirements.

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***Specimen***

**Specimen Type:** Blood

**Container:** **Dark Blue top with Red Stripe** : Metal Free Navy (No additive) Trace Element tube– available from the laboratory Mayo supply T184

**Draw Volume:** 2.4 mL (Minimum: 1.5 mL) blood

**Processed Volume:** 0.8 mL (Minimum: 0.2 mL) serum

Note: Submission of the minimum volume does not allow repeat analysis.

**Collection:** Use stainless steel needle or butterfly vacutainer collection. Collect in a royal blue top tube (See [Container](#)). Avoid hemolysis.

**Special Processing:** Lab Staff: Blood specimens for serum testing should be collected in the dark blue-top with red stripe, Trace Element Blood Collection Tube.

1. Allow the specimen to clot for 30 minutes; then centrifuge the specimen to separate serum from the cellular fraction within 4 hours of specimen collection.

2. Remove the stopper and carefully pour serum aliquot into a 7 mL, **Mayo metal free, screw-capped, polypropylene vial (Mayo Supply T173)**, and avoiding transfer of the cellular components of blood.

**Do Not** insert a pipet into the serum to accomplish transfer, and **Do Not** ream the specimen with a wooden stick to assist with serum transfer.

3. Place the cap on the polypropylene vial tightly, attach a specimen label and send specimen to the laboratory refrigerated.

Specimen stable refrigerated (preferred), frozen, or ambient for 28 days in a metal free container.

**Patient Preparation:** High concentrations of gadolinium, iodine, and barium are known to interfere with most metal tests. If gadolinium-, iodine, or barium-containing contrast media has been administered, the specimen should not be collected for at least 96 hours.

**Sample Rejection:** Specimens other than serum; mislabeled or unlabeled specimens

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***Interpretive***

<b>Age:</b>	<b>Reference Range (mcg/dL)</b>
0 – 2 mos.	40 – 140 mcg/dL
3 – 6 mos.	40 – 160 mcg/dL
7 – 9 mos.	40 – 170 mcg/dL
10 – 12 mos.	80 – 170 mcg/dL
13 mos. – 10 yrs.	80 – 180 mcg/dL

11 – 17 yrs.	75 – 145 mcg/dL
≥18 yrs. (Males)	73-129 mcg/dL
≥18 yrs. (Females)	77-206 mcg/dL

**Critical Values:**

N/A

**Limitations:**

Gadolinium is known to interfere with most metal tests. If gadolinium-containing contrast media has been administered, a specimen cannot be collected for 96 hours.

**Methodology:**

Dynamic Reaction Cell (DRC) II Inductively Coupled Plasma Mass Spectrometry (DRC-ICP-MS)

**References:**

[Mayo Clinic Laboratories](#) December 2024

**Updates:**

11/11/2008: Reference range previously reported as 0.75 - 1.45 µg/mL for all ages. New reference ranges have now been established for pediatrics.  
4/6/2010: Method change; previously listed as Inductively Coupled Plasma (ICP) Emission Spectroscopy  
9/9/2014: Clarification of tube type.  
11/23/2016: Updated minimum volume due to short samples.  
2/14/2017: Tube update.  
6/21/2022: Updated reference ranges and unit.  
12/27/2024: Updated limitations, patient preparation. Added specimen stability.