

# **COPPER (COPPERCOL)**

**TEST FOR FREE, CHELATED AND  
TOTAL COPPER IN NATURAL  
AND TREATED WATERS**

**Photometer Method**

**AUTOMATIC  
WAVELENGTH  
SELECTION**

**0 – 5.0 mg/l**

Copper occurs naturally in many waters and may also result from corrosion of pipes and fittings. The presence of copper in drinking water can give rise to discolouration or an astringent taste.

Chelated copper compounds are extensively used as algicides in swimming pool water, home aquariums and other waters. Electrolytic devices which generate copper and silver ions are used in the purification of swimming pool water.

The Palintest Coppercol method provides a simple means of measuring copper in natural and treated waters over the range 0 - 5 mg/l. The test is particularly useful since it can be used to measure specifically the concentrations of free and chelated copper present in the water.

## **Method**

In the Palintest Coppercol method, copper salts are reduced to the cuprous form and then reacted with a 2,2 Biquinoline-4,4-dicarboxylic salt to form a purple coloured complex. This provides a measure of the free copper ions present in the sample. In the second stage of the test, a decomplexing agent is introduced and this induces a further reaction with any chelated copper compounds which might be present.

The reagents are provided in tablet form and the test is simply carried out by adding tablets to a sample of the water. The intensity of colour produced in the test is proportional to the copper concentrations and is measured using a Palintest Photometer.

## **Reagents and Equipment**

Palintest Coppercol No 1 Tablets  
Palintest Coppercol No 2 Tablets  
Palintest Automatic Wavelength Selection Photometer  
Round Test Tubes, 10 ml glass (PT 595)

## **Separation of Copper Residuals**

The direct-reading photometer is programmed for both free and total copper. Use program **Phot 10** Free Copper, then select the 'Follow On' option on screen to continue test for program **Phot 11** Total Copper.

## Test Procedure

- 1 Fill test tube with sample to the 10 ml mark.
  - 2 Add one Coppercol No 1 tablet, crush and mix to dissolve.
  - 3 Gently invert the tube to remove any bubbles from the inner walls of the tube.
  - 4 Select Phot 10 on Photometer.
  - 5 Take Photometer reading in usual manner - see Photometer instructions.
  - 6 The result represents the free copper concentration as mg/l Cu. Stop the test at this stage if only free copper determination is required.
  - 7 If it is desired to measure chelated or total copper continue the test on the same test portion. Select the 'Follow On' from screen options to continue the test program.
  - 8 Add one Coppercol No 2 tablet, crush and mix to dissolve.
  - 9 Gently invert the tube to remove any bubbles from the inner walls of the tube.
  - 10 Take Photometer reading.
  - 11 The result represents the **Total Copper** concentration as mg/l Cu.
  - 12 The **Chelated Copper** concentration is obtained by subtracting the free copper concentration from the total copper concentration :-  
ie Chelated Copper = Total Copper - Free Copper
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