

FORENSIC SCIENCE

VI SEMESTER

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Test for Copper:

i) Test with ammonium hydroxide

- Take the test sample solution (dissolve the sample in water or dil HCl or conc. HCl or dil/conc. HNO₃ or aqua-regia to form original solution) and add to it ammonium hydroxide.
- Appearance of blue color indicates the positive test for the presence of Copper.

ii) Test with Alizerin blue :

- Take a drop of reagent (saturated solution of alizerin blue in pyridine) in a depression spot plate and add to it a drop of test solution.
- Run a parallel blank test with water also.
- Blue color appears in both the cases.
- Now add 1-2 drops of acetic anhydride, the color in the blank test converts into yellow but remaining of blueviolet precipitate in test sample indicates the positive test for the presence of Copper.
- Alternate Method: Take 1-2 drops of test solution in depression spot plate and evaporate it to dryness. Add a drop of the reagent and followed by a drop of glacial acetic acid.
- Appearance of blue-violet color indicates the positive test for the presence of Copper.

iii) Flame Test: Copper gives bluish green color when it is tested by flame test as described in the testing of sodium.

Test for Iron

i) Test with Potassium ferrocyanide:

- Take few drops of test solution or original solution, add to it a drop of conc. Nitric acid and boil for few minutes.
- Add Potassium ferrocyanide solution.
- Appearance of blue color indicates the positive test for the presence of Iron.

ii) Test with thiocyanate :

- Take few drops of test solution or original solution, add to it a drop of conc. Nitric acid and boil for few minutes.
- Add ammonium or potassium thiocyanate solution.
- Appearance of red color indicates the positive test for the presence of Iron.

The above tests can be performed on filter paper or spot tile

Put a drop of test solution on a filter paper or spot plate, add to it a drop of Potassium ferrocyanide solution. Appearance of blue color on paper or plate indicates the positive test for the presence of Iron.

Put a drop of test solution on a spot plate, add to it a drop of potassium thiocyanate solution (1%). Appearance of red color indicates the positive test for the presence of Iron.

Other alternate methods:

I) ICP-AES Method

- ii) Ion Chromatography
- iii) Atomic Absorption Spectrophotometry (AAS)
- iv) Atomic Emission Spectrography
- v) Fluorescence-XRD etc.

These techniques / methods can also be used for the detection of above cations and anions depending upon the nature of the exhibits

TEST FOR GOLD:

Test with Benzidine:

Few drops of the exhibit solution is placed on a filter paper and add 1-2 drops of benzidine reagent solution on it.

A blue colour appears on the filter paper, which indicates the presence of gold.

Reagent: 0.05% solution of benzidine in 10% acetic acid

Test with Rhodamine B :

Few drops of the exhibit solution is placed is taken in a micro test tube and add one-two drops of HCl acid and 1-2 drops of rhodamine B reagent solution and mix properly.

The test tube is shaken with about 8-10 drops of benzene.

Appearance of red-violet to pink colour in benzene layer indicates the presence gold.

After about 1-2 minutes it displays an orange fluorescence if it is observed under quartz lamp.

Reagent:

1) 0.01 g. rhodamine B dye stuff in 100 ml water

2) 0.2% aq. rhodamine B solution (given under detection of gold in alloys, coating etc.) the sensitive and specific test for gold with rhodamine B.

Test with Oxalic Acid :

An appropriate portion of the exhibit generally heated till NO₂ fumes removed. This solution is made alkaline by adding sodium hydroxide solution. Solid oxalic acid was added and generally heated. Brownish black precipitate indicates the presence of gold.