

FORENSIC SCIENCE
VI SEMESTER

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METHANOL

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| Methyl alcohol | Methanol, Carbinol, wood spirit. Source: The liquid fraction pyro ligenous acid in the destructive distillation of wood contains methanol as a major constituent. Can be synthesized commercially. | A colourless liquid, B.P. 64.7°C, mixes with water and organic solvents, peculiar odour and a burning taste. | Extremely poisonous & causes blindness and even death. Metabolised by oxidation to formaldehyde, formic acid & finally formate. |
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The screening is done in three steps ,

- a) Smell
- b) Colour tests
- c) UV-spectra

A small portion of the distillate may also be subjected to GC/GC Headspace examination and the retention time of the peaks can be compared with the standard references available in literature and confirmed by the injection of a control. For this purpose, normal Flame Ionization Detector is used and the columns used normally are Carbowax or Hellcomid.

Test for Methanol:

a) Chromotropic Acid Test :

- Take about 1 ml or appropriate amount of sample (distilled or as such depending upon the nature of sample and concentration of methanol) in a test tube add about 2 ml of potassium permanganate solution (3 gm potassium permanganate and 15 ml of phosphoric/ortho phosphoric acid in 100 ml distilled water) and shake well.
- Now add few crystals of sodium bisulphate with shaking till disappearance of colour (potassium permanganate colour) of the solution. Add about 1 ml of chromotropic acid (5% of aqueous solution of sodium salt of chromotropic acid) and add concentrate sulphuric acid slowly with inner sidewall of the test tube to the extent of 15 ml.
- Appearance of violet colour indicates the presence of methanol.

b) Schiff's Reagent Test :

- Take about 4.5 ml of sample (distilled or as such depending upon the nature of sample) in a test tube and add 0.5 ml of ethanol (if the concentration of ethanol is high in the sample, the sample is fortified accordingly so that 5 ml volume should contain only 0.5 ml ethanol).
- Add 2 ml of 3% Potassium Permanganate solution and .2ml of phosphoric acid. Keep it for 10 minutes. Add 1 ml of 10% oxalic acid followed by 1ml of concentrated sulphuric acid.
- The contents are cold at room temperature. Now add 5 ml of schiff's reagent, keep it for half an hour and observe the colour.
- Appearance of purple colour indicates positive test for the presence of methanol. The parallel experiments may also been carried out with control sample containing 0.5 ml solution (0.5% methanol in rectified spirit/ethanol) mixed with 4.5 ml of water and a blank sample having 5 ml water.
- The colour appeared in the test sample may be matched with the colour of the control/standard sample of methanol which is **equivalent to 2 mg of methanol**. Thus the semi-quantitative examination of methanol may be carried out.