

# QUALITATIVE TEST OF FORMALDEHYDE (Chromotropic Acid Test)

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## INTRODUCTION

Formalin (36% formaldehyde), a powerful preservative, is not permitted to be added to foods. Any food however may contain up to 5 mg/kg (ppm) formaldehyde derived from any wet strength wrapping containing formaldehyde based resin, or of plastic food containers or utensils made from any resin of which formaldehyde is a condensing component. The additive dimethylpolysiloxane may contain up to 1000 mg/kg formaldehyde. Traces of formaldehyde may be found in smoked fish derived from the smoke constituents (Shewan, 1949). These however are not considered to be preservatives by definition.

## APPARATUS

1. Kjeldahl flask, 800 ml
2. Cone, double plain ends
3. Plain bend, socket to cone
4. Liebig condenser
5. Measuring cylinder, 100 ml
6. Test tube, 15 ml
7. Heating mantle
8. Water bath
9. Pipettes, 1 ml, 5 ml

## REAGENTS

1. Phosphoric acid,  $\text{H}_3\text{PO}_4$
2. 72% Sulphuric acid  
Pour 150 ml  $\text{H}_2\text{SO}_4$  into 100 ml water and cool.
3. Saturated solution of 1,8-dihydroxynaphthalene 3,6-disulphonic acid in ca. 72%  $\text{H}_2\text{SO}_4$ .

Weigh about 500 g of the above and make up to 100 ml in 72%  $\text{H}_2\text{SO}_4$ .  
The solution is light straw coloured.

## PROCEDURE

1. Macerate 100 g sample (solid or semisolid) with 100 ml distilled water in mortar. If sample is liquid, measure 200 ml of sample.
2. Transfer to 800 ml Kjeldahl flask.
3. Acidify with  $\text{H}_3\text{PO}_4$  and add 1 ml excess.
4. Connect with condenser through trap.
5. Slowly distil 50 ml at a speed of 3 ml in 12 - 14 min.
6. Place 5 ml of saturated solution of 1,8-dihydroxynaphthalene 3,6-disulphonic acid in ca. 72%  $\text{H}_2\text{SO}_4$  into a test tube.
7. Add with mixing 1 ml of distillate from Step 5.
8. Place in boiling water bath for 15 min.
9. Observe during heating period for colour development. Presence of formaldehyde is indicated by appearance of light to deep purple (depth of colour depending on amount of formaldehyde present).

## REMARKS

Detection limit : 1 ppm.

## REFERENCE

Horwitz, W. (1980). 13th Ed. Official Methods of Analysis of the Association of Official Analytical Chemists. p 331, 530-531.

Pearson, D. (1976). 7th Ed. The Chemical Analysis of Foods. p 40-41.

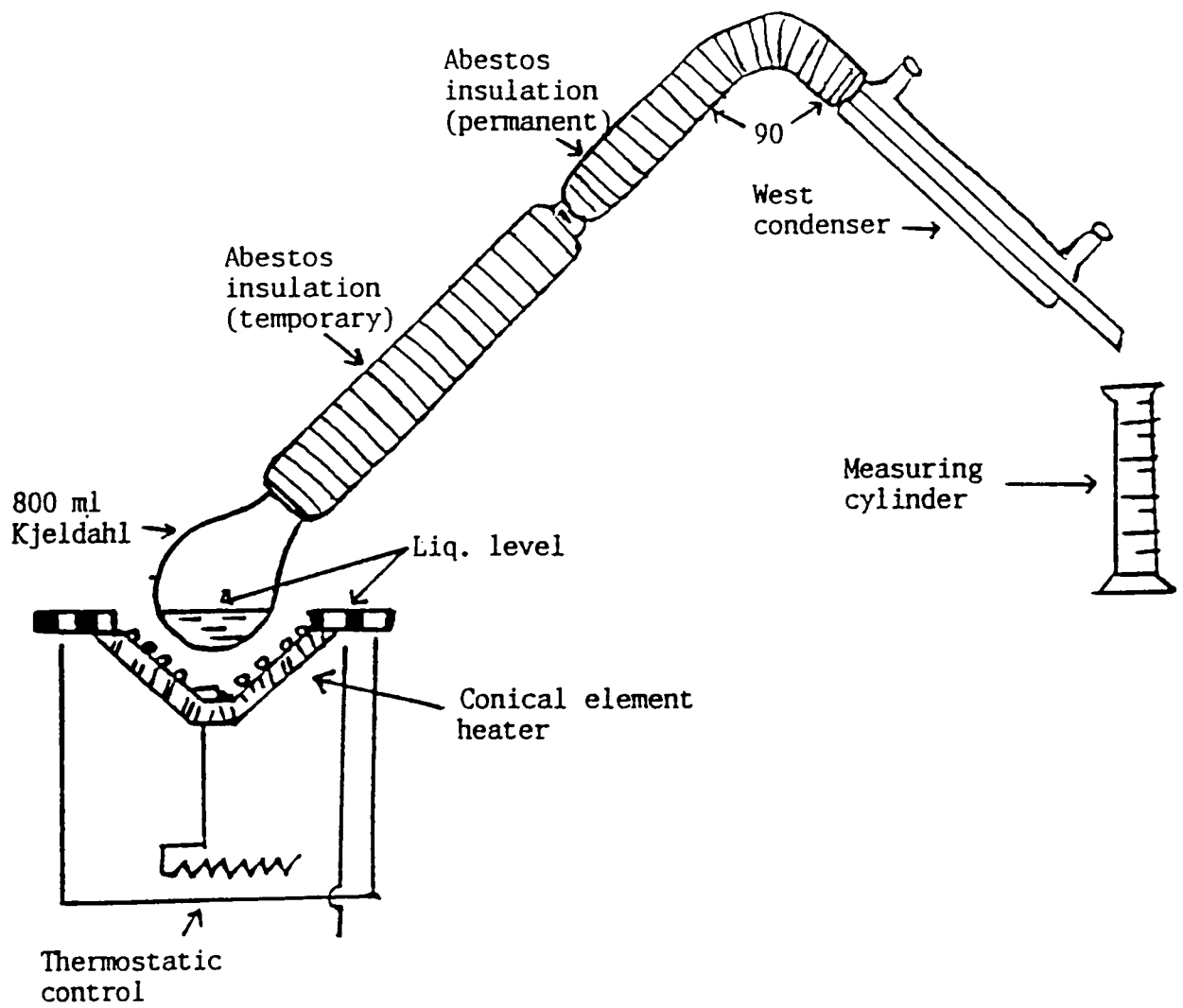


Fig. 1. Distillation unit for formaldehyde determination (chromotropic acid test)