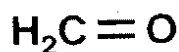


# FORMALDEHYDE 156

## FORMALDEHYDE

156



<i>Chemical name</i>	Formaldehyde (IUPAC and CA; 50-00-0)
<i>Other names</i>	Methanal
<i>Empirical formula</i>	CH <sub>2</sub> O
<i>RMM</i>	30.03
<i>b.p.</i>	-19.5°C
<i>Solubility</i>	In water 55%. Soluble in ethanol and diethyl ether
<i>Formulations</i>	Formulated as aqueous solution

## FORMALDEHYDE SOLUTIONS

\*156/OL/M/

**1 Sampling.** Take at least 250 ml.

**2 Identity tests.** Not yet standardized.

### 3 Formaldehyde

**OUTLINE OF METHOD** The sample is dissolved in standardized sodium hydroxide and oxidised to sodium formiate with hydrogen peroxide. Excess sodium hydroxide is titrated with sulfuric acid.

#### REAGENTS

*Sulfuric acid* standard solution  $c(\text{H}_2\text{SO}_4) = 1 \text{ mol/l}$ , RE 28.1

*Sodium hydroxide* standard solution  $c(\text{NaOH}) = 1 \text{ mol/l}$ , RE 25.1

*Hydrogen peroxide solution*, RE 56. Dilute with water to a solution containing about 3% hydrogen peroxide, neutralize with sodium hydroxide  $c(\text{NaOH}) = 1 \text{ mol/l}$ , using litmus or bromothymol blue indicator.

*Litmus indicator solution.* Solution of purified litmus of such concentration that 3 drops give distinct blue colour to 50 ml water.

*Bromothymol blue solution.* Dissolve 1 g bromothymol blue in 500 ml ethanol-water (50 → 100 ml v/v).

#### APPARATUS

*Erlenmeyer flask.* 500 ml

*Pipette,* 50 ml

*Weighing pipette*

*Steam bath*

\* AOAC-CIPAC method 1976.

## PROCEDURE

Pipette 50 ml sodium hydroxide,  $c(\text{NaOH}) = 1 \text{ mol/l}$  into an erlenmeyer flask and add hydrogen peroxide solution (50 ml). Weigh (to the nearest mg) about 3 g ( $w \text{ g}$ ) of sample into a weighing pipette and transfer to the erlenmeyer flask letting the point of the pipette nearly reach the liquid in the flask. Place a funnel in the neck of the flask and heat on a steam bath for about 5 min. Shake occasionally. Remove the flask from the bath, wash the funnel with water and cool to room temperature. Titrate the excess sodium hydroxide with sulfuric acid solution ( $t \text{ ml}$ ), using bromothymol or litmus. When using litmus cool the flask to obtain a sharp end-point. Determine free acid in a separate portion ( $y \text{ g}$ ) of sample, replacing the hydrogen peroxide solution by water and omitting the heating. Sulfuric acid used for the back titration  $b \text{ ml}$ .

$$\text{Formaldehyde content} = \frac{300.3 \times (50 N_1 - t N_2)}{w} - \frac{300.3 \times (50 N_1 - b N_2)}{y} \text{ g/kg}$$

where:

$N_1$  = normality of the standard sodium hydroxide solution

$N_2$  = normality of the standard sulfuric acid solution