

DIETHYL ETHER

Prepared at the 55th JECFA (2000) and published in FNP 52 Add 8 (2000), superseding tentative specifications prepared at the 37th JECFA (1990) and published in FNP 52 (1992). No ADI was allocated at the 37th JECFA (1990).

Warning: Determination to be made only after ensuring that the sample complies with the test for peroxides. It is dangerous to distil or evaporate Diethylether which does not comply with the Test for peroxides (see Volume 4).

SYNONYMS

Ether, Ethyl ether

DEFINITION

Diethyl ether normally contains appropriate stabilizers such as pyrogallol or BHT. Manufacturers should indicate on the label the specific stabilizer(s) used and the amount added. Typical levels are in the range of 3-7 mg/l.

Chemical names

Diethyl ether, diethyl oxide, 1,1'-oxybisethane

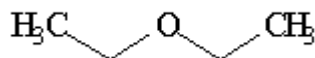
C.A.S. number

60-29-7

Chemical formula

C₄H₁₀O

Structural formula



Formula weight

74.12

DESCRIPTION

Colourless, clear, very mobile liquid, with a characteristic odour; very volatile and flammable.

FUNCTIONAL USES Extraction solvent

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4)

Insoluble in water; miscible with ethanol

Specific gravity (Vol. 4)

0.714 - 0.716

PURITY

Distillation range (Vol. 4)

34 - 35° (see warning above)

Non-volatile residue
(Vol. 4)

Not more than 2 mg/100 ml (see warning above)

Water (Vol.4)

Not more than 0.2% (Karl Fischer Method)

Acidity

To 20 ml of 95% ethanol in a 50-ml stoppered measuring cylinder, add 0.5 ml of phenolphthalein TS and just sufficient 0.02 N sodium hydroxide to

produce a pink colour which persists after gentle shaking for 30 sec. Add a further 0.3 ml of 0.02 N sodium hydroxide and 25 ml of the sample, stopper the cylinder, mix and shake gently for 30 sec. The pink colour is not discharged.

Aldehydes and ketones

Place 2 ml of Nessler's TS in a stoppered tube of about 12-ml capacity and about 1.5-cm diameter and fill the tube with the sample. Insert the stopper, shake vigorously for 10 sec, and allow to stand in the dark for 5 min. If no colour or turbidity is produced at this stage, the sample is considered to have complied with the test. If colour or turbidity is produced, after ensuring that the sample complies with the test for peroxides distil a further quantity of the sample in a fractionating column and repeat the test on the distillate. No colour or turbidity is produced.

Peroxides

Passes test

The colour produced by iodine liberated by the action of organic peroxides on potassium iodide is compared with that of a standard iodine solution. Place 8 ml of freshly prepared 10 % potassium iodide solution in a stoppered tube of 12-ml capacity and about 1.5 cm diameter. Fill the tube to the brim with the sample, place the stopper in position so that no air bubble is enclosed, shake vigorously, and allow to stand in the dark for 30 min. The yellow colour produced, if any, is no darker than that of 0.5 ml of 0.001 N iodine diluted with 8 ml of the potassium iodide solution.

Lead (Vol. 4)

Not more than 2 mg/kg.

Determine using an atomic absorption technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the method described in Volume 4, "Instrumental Methods."