PROPIONIC ACID

Prepared at the 51st JECFA (1998), published in FNP 52 Add 6 (1998) superseding specifications prepared at the 49th JECFA (1997), published in FNP 52 Add 5 (1997). ADI "not limited" established at the 17th JECFA in 1973.

SYNONYMS Propanoic acid, ethylformic acid, methylacetic acid, INS No. 280

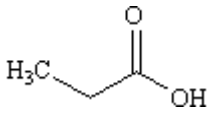
DEFINITION

Chemical names: Propionic acid

C.A.S. number: 79-09-4

Chemical formula: $C_3H_6O_2$

Structural formula:



Formula weight: 74.08

Assay: Not less than 99.5% on dried basis

DESCRIPTION An oily liquid with a slightly pungent odour

FUNCTIONAL USES Preservative, antimould, antirope agent, flavouring agent (see "Flavouring agents" monograph JECFA no. 84)

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4): Miscible with water and ethanol

Specific gravity (Vol. 4): d^{20}_{20}: 0.993-0.997

PURITY

Distillation range (Vol. 4): 138.5 - 142.5°

Non-volatile residue (Vol. 4): Not more than 0.01% when dried at 140° to constant weight

Formic acid: Not more than 0.1%
See description under TESTS

Aldehydes: Not more than 0.2% (as propionaldehyde)
See description under TESTS

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.”

TESTS

PURITY TESTS

Formic acid

Dissolve 15 g of sodium hydroxide in 50 ml of water, cool, add 6 ml of bromine, stirring to effect complete solution, and dilute to 2,000 ml with water. Transfer 25.0 ml of this solution, into a 250 ml, glass-stoppered Erlenmeyer flask containing 100 ml of water, and add 10 ml of a 1 in 5 solution of sodium acetate and 10.0 ml of the sample. Allow to stand for 15 min, add 5 ml of a 1 in 4 solution of potassium iodide and 10 ml of hydrochloric acid, and titrate with 0.1 N sodium thiosulfate just to the disappearance of the brown colour. Perform a blank determination. The difference between the volume of 0.1 N sodium thiosulfate required for the blank and that required for the sample is not more than 4.4 ml.

Aldehydes

Transfer 10.0 ml of the sample into a 250-ml glass-stoppered conical flask containing 50 ml of water and 10.0 ml of a 1 in 8 solution of sodium bisulfite. Stopper the flask, and shake vigorously. Allow the mixture to stand for 30 min, then titrate with 0.1N iodine to the same brownish yellow end-point obtained with a blank treated with the same quantities of the same reagents. The difference between the volume of 0.1N iodine required for the blank and that required for the sample is not more than 7 ml.

METHOD OF ASSAY

Mix 3 g of the sample, weighed to the nearest 0.1 mg, with 50 ml of water in a 250-ml flask. Add phenolphthalein TS, and titrate with 1N sodium hydroxide to the first appearance of a faint pink end-point which persists for at least 30 sec. Each ml of 1N sodium hydroxide is equivalent to 74.08 mg of $C_3H_6O_2$.