SORBITAN MONOLAURATE

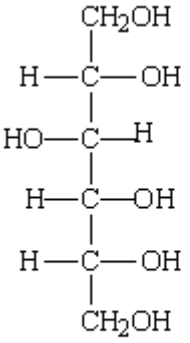
Prepared at the 55th JECFA (2000) and published in FNP 52 Add 8 (2000), superseding specifications prepared at the 44th JECFA (1995) and published in FNP 52 Add 3 (1995). A group ADI of 0-25 mg/kg bw for sorbitan esters of lauric, oleic, palmitic, and stearic acid was established at the 26th JECFA (1982).

SYNONYMS Sorbitan laurate; INS No. 493

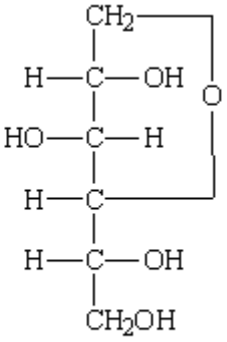
DEFINITION A mixture of the partial esters of sorbitol and its mono- and dianhydrides with edible lauric acid

C.A.S. number 1338-39-2

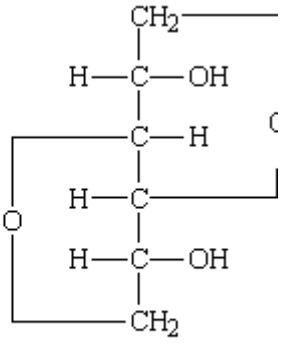
Structural formula Contains lauric acid esterified with polyols derived from sorbitol including the following types:



Sorbitol



1,4-Sorbitan



Isosorbide

Assay Saponification of 100 g of the sample yields not less than 36 g and not more than 49 g of polyols, and not less than 56 g and not more than 68 g of fatty acids. The polyol content shall be not less than 95% of a mixture of sorbitol, 1,4-sorbitan and isosorbide.

DESCRIPTION Amber-coloured oily viscous liquid, light cream to tan beads or flakes or a hard, waxy solid with a slight odour

FUNCTIONAL USES Emulsifier, stabilizer

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4) Dispersible in hot and cold water

PURITY

Water (Vol. 4) Not more than 2% (Karl Fischer Method)

Sulfated ash (Vol. 4)	Not more than 0.5%
Acid value (Vol. 4)	Not more than 7
Saponification value (Vol. 4)	Not less than 155 and not more than 170
Hydroxyl value (Vol. 4)	Not less than 330 and not more than 358
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.”

METHOD OF ASSAY

Transfer about 25 g of the sample, accurately weighed, into a 500-ml round-bottom flask, add 250 ml of alcohol and 7.5 g of potassium hydroxide, and mix. Connect a suitable condenser to the flask, reflux the mixture for 1 to 2 h, and then transfer to an 800-ml beaker, rinsing the flask with about 100 ml of water and adding it to the beaker. Heat on a steam bath to evaporate the alcohol, adding water occasionally to replace the alcohol, and evaporate until the odour of alcohol can no longer be detected. Adjust the final volume to about 250 ml with hot water.

Neutralize the soap solution with dilute sulfuric acid (1 in 2), add 10% in excess, and heat, while stirring, until the fatty acid layer separates. Transfer the fatty acids to a 500-ml separator, wash with three or four 20-ml portions of hot water to remove polyols, and combine the washings with the original aqueous polyol layer from the saponification. Extract the combined aqueous layer with three 20-ml portions of petroleum ether, add the extracts to the fatty acid layer, evaporate to dryness in a tared dish, cool and weigh.

Neutralize the polyol solution with a 1 in 10 solution of potassium hydroxide to pH 7 using a suitable pH meter. Evaporate this solution to a moist residue, and separate the polyols from the salts by several extractions with hot alcohol. Evaporate the alcohol extracts on a steam bath to dryness in a tared dish, cool, and weigh. Avoid excessive drying and heating.