

SORBITAN MONOLEATE

Prepared at the 33rd JECFA (1988), published in FNP 38 (1988) and in FNP 52 (1992). Metals and arsenic specifications revised at the 55th JECFA (2000) A group ADI of 0-25 mg/kg bw as the sum of sorbitan esters of lauric, oleic, palmitic and stearic acids was established at the 26th JECFA (1982)

SYNONYMS

INS No. 494

DEFINITION

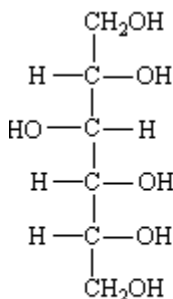
A mixture of the partial esters of sorbitol and its mono- and dianhydrides with edible oleic acid (R). The constituent in greatest abundance is 1,4-sorbitan monooleate, with lesser abundance of isosorbide monooleate, sorbitan dioleate and sorbitan trioleate.

C.A.S. number

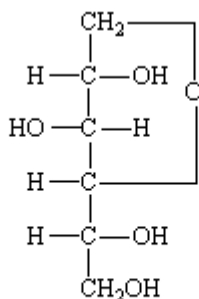
1338-43-8

Structural formula

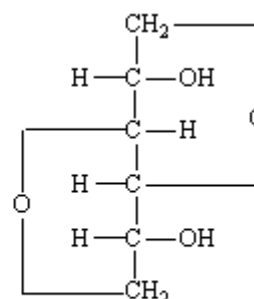
Contains oleic acid esterified with polyols derived from sorbitol including the following types:



Sorbitol



1,4-Sorbitan



Isosorbide

Assay

Saponification of 100 g of the sample yields not less than 28 g and not more than 32 g of polyols, and not less than 73 g and not more than 77 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)

Soluble at temperatures above its melting point in ethanol, ether, ethylacetate, aniline, toluene, dioxane, petroleum ether and carbon tetrachloride; insoluble in cold water, dispersible in warm water

Iodine value (Vol. 4)

The residue of oleic acid, obtained from the saponification of the sorbitan monooleate in assay, has a iodine value between 80 and 100

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 8

Saponification value
(Vol. 4) Not less than 145 and not more than 160

Hydroxyl value (Vol. 4) Not less than 193 and not more than 210

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. Assay another 25 g sample by the *Sorbitan Ester Content* procedure to determine percent sorbitan ester.