

## POLYGLYCEROL ESTERS of FATTY ACIDS

*Prepared at the 35th JECFA (1989), published in FNP 49 (1990) and in FNP 52 (1992) superseding specifications prepared at the 27th JECFA (1983), published in FNP 28 (1983). Metals and arsenic specifications revised at the 55th JECFA (2000). An ADI of 0-25 mg/kg bw was established at the 35th JECFA (1989)*

### SYNONYMS

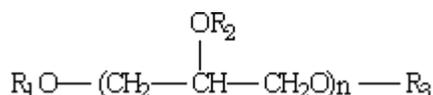
Polyglycerol fatty acid esters, glycerin fatty acid esters; INS No. 475

### DEFINITION

Mixed partial esters formed by reacting polymerized glycerols with edible fats, oils, or fatty acids; minor amounts of mono-, di-, and triglycerides, free glycerol and polyglycerols, free fatty acids, and sodium salts of fatty acids may be present; degree of polymerization varies, and is specified by a number (such as tri-) that is related to the average number of glycerol residues per polyglycerol molecule. A specified polyglycerol consists of a distribution of molecular species characteristic of its nominal degree of polymerization. By varying the proportions as well as the nature of the fats or fatty acids to be reacted with the polyglycerols, a large and diverse class of products may be obtained.

The article of commerce may be further specified as to saponification value, solidification point of the free fatty acids, iodine value, hydroxyl value and ash content.

Structural formula



where the average value of n is about 3 and R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> each may be a fatty acid moiety or hydrogen

### DESCRIPTION

Light yellow to amber, oily to very viscous liquids; light tan to medium brown, plastic or soft solids; and light tan to brown, hard, waxy solids

**FUNCTIONAL USES** Emulsifier

### CHARACTERISTICS

#### IDENTIFICATION

Solubility (Vol. 4)

From very hydrophilic to very lipophilic, but as a class tend to be dispersible in water and soluble in organic solvents and oils

Tests for fatty acids  
(Vol. 4)

Passes tests

Test for glycerol and polyglycerols

Spot 5 to 20 µl of the aqueous layer obtained in the test for fatty acids *Identification tests for functional groups* alongside control spots of glycerol on paper such as Whatman No. 3 and develop using descending chromatography for 36 h with isopropanol: water (90:10). The glycerol spot moves 40 cm and the polyglycerols are revealed in succession below that for glycerol when the paper is sprayed with either permanganate in acetone or ammoniacal silver nitrate.

PURITY

Acids (Vol. 4)

Acids other than fatty acids shall not be detectable

Polyglycerols

The polyglycerol moiety shall be composed of not less than 70% of di-, tri- and tetraglycerols and shall contain not more than 10% of polyglycerols equal to or higher than heptaglycerol.

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."