Polysorbate 80

Polyoxyethylene (20) Sorbitan Monooleate; Sorbitan, Mono-9-octadecenoate; Poly(oxy- 1,2-ethanediyl) Derivative

CAS: [9005-65-6]

DESCRIPTION

Polysorbate 80 is a mixture of oleate partial esters of sorbitol and sorbitol anhydrides condensed with approximately 20 moles of ethylene oxide (C_2H_4O) for each mole of sorbitol and its mono- and dianhydrides. It is a yellow- to orange-colored, oily liquid having a faint, characteristic odor and a warm, somewhat bitter taste. It is very soluble in water, producing an odorless, nearly colorless solution, and is soluble in alcohol, in fixed oils, in ethyl acetate, and in toluene. It is insoluble in mineral oil.

Functional Use in Foods Emulsifier; stabilizer.

REQUIREMENTS

Identification

A. To 5 mL of a 1 in 20 solution add 5 mL of 1 *N* sodium hydroxide, boil for a few min, cool, and acidify with 2.7 *N* hydrochloric acid. The solution is strongly opalescent.

B. To a 1 in 20 solution add bromine TS, dropwise. The bromine is decolorized.

C. A mixture of 60 volumes of Polysorbate 80 with 40 volumes of water at 25° or below yields a gelatinous mass.

Assay for Oxyethylene Content Not less than 65.0% and not more than 69.5% of oxyethylene groups (—C_2H_4O—), equivalent to between 96.5% and 103.5% of Polysorbate 80, calculated on the anhydrous basis.

Acid Value Not more than 2.

1,4-Dioxane Not more than 10 mg/kg.

Heavy Metals (as Pb) Not more than 10 mg/kg.

Hydroxyl Value Between 65 and 80.

Oleic Acid Between 22 and 24 g/100 g of sample.

Residue on Ignition Not more than 0.25%.

Saponification Value Between 45 and 55.

Water Not more than 3.0%.

TESTS

Assay for Oxyethylene Content Weigh accurately a 65-mg sample, and proceed as directed in the general method, Appendix VII.

Acid Value Determine as directed for *Acid Value, Method II*, under *Fats and Related Substances*, Appendix VII.

1,4-Dioxane Determine as directed under *1,4-Dioxane* in the monograph for *Polysorbate 20*.

Heavy Metals Prepare and test a 2-g sample as directed in *Method II* under the *Heavy Metals Test*, Appendix IIIB, using 20 μg of lead ion (Pb) in the control (*Solution A*).

Hydroxyl Value Determine as directed under *Method II* in the general method, Appendix VII.

Oleic Acid Isolate the fatty acids as directed under *Lauric Acid* in the monograph for *Polysorbate 20*, and determine the weight of the acid. The product so obtained has an *Acid Value* between 193 and 206 (*Method I*, Appendix VII) and an *Iodine Value* between 80 and 92 (*Modified Wijs Method*, Appendix VII).

Residue on Ignition Ignite 5 g as directed in the general method, Appendix IIC.

Saponification Value Determine as directed in the general method, Appendix VII, using about 8 g, accurately weighed.

Water Determine by the *Karl Fischer Titrimetric Method*, Appendix IIB.

Packaging and Storage Store in tight containers.