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Polyhydric Alcohol Fatty Acid Ester Type Nonionic Surfactants, Exhibiting Excellent Emulsifiability, Dispersibility, Solubilizing and Rust Preventive Properties

IONET S Products
IONET T Products

Preface

IONET S and IONET T products are polyhydric alcohol fatty acid ester type nonionic surfactants. These products are produced by using sorbitan as polyhydric alcohol components. They can be used as emulsifiers, solubilizing agents, dispersants and rust preventive agents.

IONET S products are fatty acid esters of sorbitan, and are nonionic surfactants which are generally known as SPAN type products.

IONET T products are ethylene oxide adducts of IONET S products, and are nonionic surfactants which are generally known as TWEEN type products.

<Lists of IONET S and IONET T products>

	Product Name	Active Ingredient Chem./Tech. Name
IONET S products	IONET S-20	Sorbitan monolaurate
	IONET S-60V	Sorbitan monostearate
	IONET S-80	Sorbitan monooleate
	IONET S-85	Anhydrosorbitol trioleate
IONET T products	IONET T-20C	Polyoxyethylene(20) sorbitan monolaurate
	IONET T-60V	Polyoxyethylene(20) sorbitan monostearate
	IONET T-80V	Polyoxyethylene(20) sorbitan monooleate

* International Nomenclature of Cosmetic Ingredients

Sanyo Chemical

1. Typical Properties

Table 1 shows the typical properties of IONET S and IONET T products. The values are representative.

Table 1. Typical Property

Product Name	Appearance	pH	HLB
IONET S-20	Straw-colored liquid	7.0 (1 wt % aqueous solution)	8.6
IONET S-60V	Pale yellow granule	8.0 (1 wt % aqueous solution)	4.7
IONET S-80	Straw-colored liquid	7.0 (1 wt % aqueous solution)	4.3
IONET S-85	Straw-colored liquid	−	1.8
IONET T-20C	Yellow liquid	−	16.7
IONET T-60V	Yellow liquid	−	14.9
IONET T-80V	Yellow liquid	7.0 (5 wt % aqueous solution)	15.0

2. Solubility

Table 2 shows the solubility of these products. The values are representative.

Table 2. Solubility

Product Name	Solubility			
	Water	Methanol	Xylene	Liquid Paraffin
IONET S-20	B – C	A	A	A
IONET S-60V	C	A – B	A – B	A – B
IONET S-80	C	A – B	A	A
IONET S-85	C	A – B	A	A
IONET T-20C	A	A	B	C
IONET T-60V	A	A	B	C
IONET T-80V	A	A	B	C

A: completely dissolved B: mostly dissolved C: slightly dissolved, or dispersed

Application

1. Cosmetic and Pharmaceutical Industries

IONET S products and IONET T products can be used as emulsifiers of creams and hydrophilic ointment bases, which are made mostly from stearic acid and mineral oil.

Formula for vanishing creams:	wt %
Stearic acid:	15.0
IONET S-60V:	2.0
IONET T-60V:	1.5
Mineral oil:	1.5
Glycerin:	5.0
Perfume:	Proper quantity
Water:	Balance
Total:	100.0

Formula for hydrophilic ointment bases:	wt %
(1) Stearic acid:	12.5
(2) IONET S-60V:	10.0
(3) IONET T-60V:	6.0
(4) Preservative:	Proper quantity
(5) Water:	Balance
Total:	100.0

Preparation method:

(1), (2) and (3) are mixed at approx. 80 °C uniformly. A mixture of (4) and (5) is heated to approx. 85 °C, added to the other mixture drop by drop, and then emulsified uniformly. It is removed after being cooled to approx. 35 °C.

2. Metal Industry

These products can be used for rust preventive oil, lubricating oil, metal working oil, etc.

Formula for rust preventive oil:	wt %
Mineral oil:	80.0
IONET S-80 (or S-85):	6.0
NAROACTY CL-50 *1:	3.0
Alkaline earth metal salt of petroleum sulfonate:	4.0
Water-soluble aliphatic alcohol or ketone:	4.0
Water:	3.0
Total:	100.0

*1 Polyoxyethylene alkyl ether, a Sanyo Chemical product

Formula for rust preventive lubricating oil:	wt %
Mineral oil:	95.0
IONET S-80 (or S-85):	2.0
Calcium petroleum sulfonate:	1.5
SANHIBITOR 102 *2 :	1.5
Total:	100.0

*2 Oil soluble rust preventive agent, a Sanyo Chemical product

Formula for lubricating oil:	wt %
Mineral oil:	94.9
IONET S-80:	2.0
Calcium petroleum sulfonate:	1.5
VANLUBE 7723 *3:	1.5
Benzotriazole:	0.1
Total:	100.0

*3 Antioxidant and extreme pressure agent, an R.T. Vanderbilt Company, Inc. product

Formula for emulsion type hydraulic oil:	wt %
Mineral oil:	92.0
IONET S-80:	2.0
NAROACTY CL-50 *1:	2.0
Calcium petroleum sulfonate:	4.0
Total:	100.0

*1 Polyoxyethylene alkyl ether, a Sanyo Chemical product

Preparation method:
To obtain a W/O (water-in-oil) type emulsion, water is added to the above mixture drop by drop while agitating. The ratio of the mixture and water is approx. 100 : 70−80.

Formula for emulsion type metal working oil:	wt %
Mineral oil:	87.0
IONET S-80:	3.0
IONET MO-600 *4:	4.0
Triethanolamine oleate salt:	6.0
Total:	100.0

*4 Polyoxyethylene monooleate, a Sanyo Chemical product

Preparation method:
To obtain an O/W (oil-in-water) type emulsion, the above mixture is added to water drop by drop while agitating. The ratio of the mixture and water is approx. 100 : 90−98.

3. Paint and Ink, and Pigment Industries

In these industries, IONET S and IONET T products can be mainly used to control wettability of organic pigments and viscosities of paint and ink.

3-1) Control Agent for Fluidity of Printing Ink

To optimally control fluidity (i.e., viscosity) depending on the printing method, surfactants with below 10 HLB value should be added to printing ink. IONET S-60V, IONET S-80 and IONET S-85 are suitable. The concentration to be applied depends on the kind of surfactant and printing ink. However, the amount of any of the above products to be used is generally 0.1 − 0.3 wt % relative to the printing ink.

3-2) Pigment-Sedimentation Inhibitor

To prevent paint and ink from sedimentation of pigments, IONET S-60V, IONET S-80 and IONET S-85 can be used (0.1 − 3.0 wt % relative to lipophilic paint and printing ink).

3-3) Pigment-Dispersion Assistant (which makes pigment-surface hydrophobic)

When hydrophilic pigments and dyes are dispersed in lipophilic vehicles to produce paint, printing ink, emulsion paint, etc., IONET S-85 can be used to improve wettability of pigments.

4. Textile Industry

IONET S and IONET T products can be used as various base materials in spin finishing because they exhibit excellent emulsifiability to fats and oils, and impart smoothness and softness to fabrics.

5. Others

IONET S and IONET T products can be widely used as emulsifiers, solubilizing agents, oiliness agents in other industries. In addition, IONET S products are applicable as defoaming agents.

Important :

Before handling these products, refer to the Safety Data Sheet for recommended protective equipment, and detailed precautionary and hazards information.

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