

functionalproducts

DISPONIL® OP 4070

Use

Emulsifiers for the manufacture of polymer dispersions, predominantly of homopolymeric and copolymeric acrylates.

Composition

Alkylaryl polyglykol ether

Specification

Water (ISO 760)	29.0 - 31.0 %
pH-value (10 %, 0,03% KCl / Q-P 1274.0 - UNE 1262)	5.5 - 7.5

Additional data

Active substance	approx. 70 %
Ionic character	non-ionic
Setting point	approx. 5 °C
Density at 20 °C	approx. 1.1 g/cm ³
CMC (g AS/l)	approx. 1.2
Cloud temperature (in 10 % NaCl solution / Q-C 2062.0)	73 - 78 °C
Appearance	colourless to clear slightly yellow liquid

Properties

Disponil OP 4070 is suitable for the manufacture of very finely dispersed polymer emulsions, which excel in their chemical stability (against NaCl, CaCl₂, Al₂(SO₄)₃ and Pb(NO₃)₂) and also in their outstanding freeze/ thaw stability.

Disponil OP 4070 may be combined with commercially available anionic DISPONIL types of the ranges AES, FES, LDBS, SDS, SLS or SUS.

Application

Application Example

The following formula and manufacturing method may be regarded as a typical example for the use of Disponil OP 4070 in the manufacture of a polymer dispersion based on butyl acrylate:

475.0	p.b.w.	water, desalinated
474.0	p.b.w.	n-butyl acrylate (e.g. BASF)
9.6	p.b.w.	methacrylic acid (e.g. Degussa)
39.0	p.b.w.	Disponil OP 4070
1.2	p.b.w.	ammonium peroxodisulfate
1.2	p.b.w.	sodium hydrogen sulfite
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1,000.0	p.b.w.	polybutyl acrylate dispersion

Equipment

Reaction vessel with two feeding devices (one of them with stirring mechanism), reflux cooler, mixing vessel.

Process

Dissolve the ammonium peroxodisulfate and Disponil OP 4070 in 425 p.b.w. of distilled water. Fill 100 litres of this solution into the reaction vessel. Disperse both the n-butyl acrylate and methacrylic acid into the remaining solution while stirring, and emulsify intensively for 15 minutes. Fill 100 litres of this emulsion, too, into the reactor vessel, while the rest of the emulsion is filled into the feeding device with stirring mechanism, and stirred until the end of the feeding time.

Dissolve the sodium hydrogen sulfite in 50 p.b.w. of water and fill this solution in the second feeding device. The monomer emulsion in the reaction vessel should now be rinsed with nitrogen for 30 minutes. Then allow 15 litres of the sodium hydrogen sulfite solution to flow into the vessel, and start heating. Polymerization will start at approximately 55 — 60 °C, noticeable by an increase of temperature. The temperature will rise to approximately 75 — 80 °C, but should be quickly reduced to approximately 68 °C. Start feeding both the monomer emulsion and sodium hydrogen sulfite solution into the reactor already while the temperature is rising. The feeding time in both cases is about two hours. During this whole period, the temperature must be kept between 67 and 69 °C. Continue to stir for further 60 minutes at the same temperature, and afterwards allow the emulsion to cool down. Adjust it to a pH-value of about 8, using a 25 ammonia solution.

Remark

Nitrogen must be added during the whole reaction time. It is also very important not to stir too intensively at the beginning of the polymerization process, in order to avoid decomposition or coagulation.

Technical data of the polymer dispersion

Appearance	white, thin liquid dispersion
Mechanical stability (Klaxon)	0.5 % coagulate
Freeze/thaw stability	very good (stable for more than 5 cycles from -14 °C to +20 °C)
Chemical stability	stable against NaCl, CaCl ₂ , Al ₂ (SO ₄) ₃ and Pb(NO ₃) ₂
Solid content	approx. 50 %

Application

e.g. raw material for adhesives, e.g. adhesive tape coatings

Dosage

The quantity required depends on the type and quantity of monomers used, the polymerization process involved, as well as on the desired properties of the polymer dispersions. Normally, 2 - 6% AS calculated on the monomer content are used.

Approvals

Food Law Approvals
BfR XIV, XV, XXI, XXXIV
FDA § 175.105; 176.180;178.3400

Regulatory Status

TSCA (USA), DSL (Canada), PICCS (Philippines), AICS (Australia), ECL (Korea), ENCS/MITI (Japan), IECSC (China), EINECS (EU)

Miscellaneous

It is recommended to store Disponil OP 4070 at room temperature and to protect them against heat and frost. Subject to storage in the original sealed containers, the products are durable for at least 24 months.

Lengthy storage of Disponil OP 4070 can sometimes lead to sedimentation. This is a characteristic reaction of the product. It is, therefore recommendable to process the whole content of the containers.

Revision-No.

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Subject to appropriate storage under the usual storage and temperature conditions, our products are durable for at least 2 years.

Suggestions of processing and using our products are given with best knowledge and information but without obligation. COGNIS does not accept any guarantee to the suitability of a product for the user's specific purpose. Furtheron the user himself assumes a liability to follow all legal regulations by using our products. The user can only pass on our sample to third parties with previous assent of COGNIS.



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