

IMWITOR[®] 375

A SUNFLOWER BASED VERSATILE O/W EMULSIFIER



OLEOCHEMICALS

PERSONAL CARE

IOI Oleo GmbH

IMWITOR® 375



The Sunflower based O/W-emulsifier for a holistic approach to sustainability

The sustainability concept is based on different building blocks, but sometimes only perceived as environmental friendliness. The concept of IMWITOR® 375 embraces the different aspects of sustainability.

- Local sourcing: the vegetable feedstock used for the production of IMWITOR® 375 originates from central Europe, transportation to our manufacturing plant and carbon footprint is reduced to a minimum
- While for many products palm oil remains the number one source because of its cost-effectiveness, IMWITOR® 375 is solely produced from sunflower oil and sugar beet root

- Energy consumption: since IMWITOR® 375 can be used in various low-energy processes, including cold-cold-emulsification, time and energy is saved in production, resulting in a very economic process
- Dosage: with a typical use concentration of only 0,5–2% IMWITOR® is a very cost-effective emulsifier and optimizes production costs even for very cost-sensitive product concepts.

INCI: Glyceryl Citrate/Lactate Linoleate/Oleate

IMWITOR® 375 is a liquid food-approved O/W emulsifier which can be used for a broad range of emulsification processes. In addition to the emulsifying properties, it provides a long lasting, rich but non-sticky skin feeling. IMWITOR® 375 is only based on vegetable feedstock without using any palm oil derivatives.

Application

IMWITOR® 375 is suitable for many different cosmetic applications:

- Face care
- Sun care
- Skin care
- Body care
- Hair conditioners
- Bath oils

Sustainability aspects in product development and production

Establishing cold/cold emulsification processes with the aim to reduce energy consumption during the manufacturing process comes along with some restraints in the selection of raw materials. Substances with high melting points, which give the emulsion a certain viscosity and body, can hardly be used. Besides its application in conventional (hot/hot) emulsification processes, IMWITOR® 375 is a key material for novel, energy saving technologies such as Pre-Emulsion-Technique and Hot/cold/cold process.

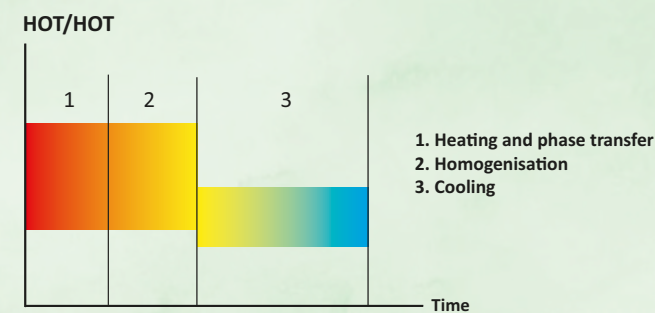
1. Pre-emulsion-technique

For this technique the oil-phase and a part of the water phase (in total max 50% of the formulation) are heated up and emulsified. This allows the use of products with high melting points and co-emulsifiers. The remaining cold water phase is then added to cool down the system. Changes in particle size distribution or viscosity compared to conventional processes cannot be observed, as the emulsification process takes place at elevated temperatures.

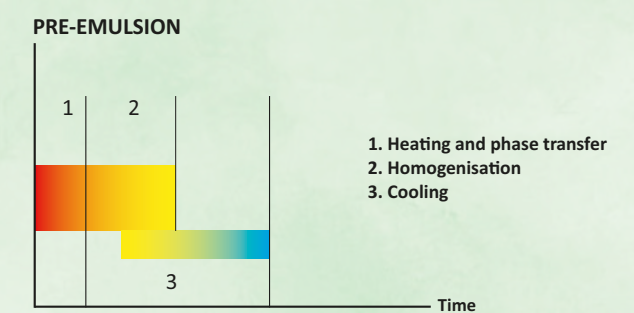
Advantage of Pre-Emulsion-Technique:

- Use of high melting raw materials
- No change in viscosity
- Particle size distribution similar to that of conventional processes
- Reduced energy consumption
- Optimised production time

Comparison of time consumption: Hot/Hot to Pre-Emulsion-Technique



Timeline of Hot/Hot Process



Timeline of Pre-Emulsion technique

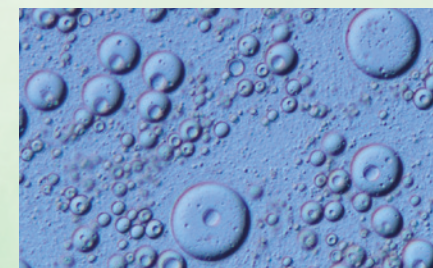
2. Hot/cold/cold process

In cold/cold processes, IMWITOR® 375 can be used at concentrations below 1% to create stable formulations. However, to achieve the best stability results, narrow and homogenous particle size distributions are needed and obtained by prolonging the homogenisation step. This will of course increase the energy consumption and processing time rather than save energy by dispensing with the heating step. The hot/cold/cold process can be an appropriate alternative.

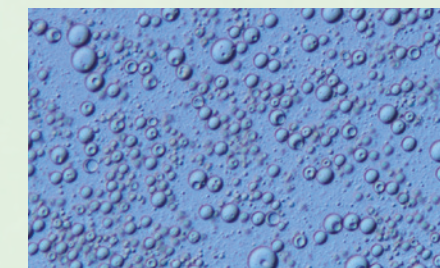
Advantage of Hot/cold/cold process:

- Short production time
- Not limited to liquid raw materials
- Optimised homogenisation step leads to small particle size distribution

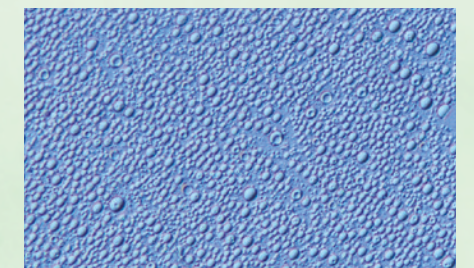
In this process, only parts of the oil phase are heated (Formulation no. 637) e.g. for the solubilisation of UV-filters. The remaining cold oil phase is added to the hot oil phase, resulting in a mixture of 35–40°C. Now the water phase can be added and the homogenisation process is started. Additionally, this approach is not limited to the use of liquid raw materials only.



Starting point
(Oil phase added to water only with stirring)



Particle size of cold/cold process with IMWITOR® 375.
Prepared with IKA UT 25, 2 minutes at 15.000 rpm.



Particle size of hot/cold/cold process with IMWITOR® 375.
Prepared with IKA UT 25, 2 minutes at 15.000 rpm.

FORMULATIONS

Lightweight Sunscreen Lotion No. 637

Hot/Cold/Cold Processed

Phase	Tradename	INCI	Amount %
A	Uvinul® A Plus	Diethylamino Hydroxybenzoyl Hexyl Benzoate	4,0
A	Uvinul® MC 80	Ethylhexyl Methoxycinnamate	10,0
B	IMWITOR® 375	Glyceryl Citrate/Lactate/Linoleate /Oleate	1,0
B	MIGLYOL® PPG 810	Propylene Glycol Dicaprylate/Dicaprate	5,0
C	Aqua dem.	Aqua	ad. 100,0
C	Glycerin 99,5	Glycerin	2,0
C	Disodium EDTA	Disodium EDTA	0,1
C	Carbopol® Ultrez 30	Carbomer	0,3
C	Preservative	Preservative	q.s.
D	Corn PO4® PH ⁴ B ⁴	Distarch Phosphate	2,0
E	Tinosorb® M	Methylene Bis-Benzotriazolyl Tetramethylbutylphenol (and) Aqua (and) Decyl Glucoside (and) Propylene Glycol (and) Xanthan Gum	2,5
F	Dermacryl® AQF	Acrylates Copolymer	2,0
G	Ethanol (96%)	Alcohol denat.	5,0
H	Citrate Buffer 0,1 mol/l pH 6,4	Citric Acid and Sodium Hydroxide	10,0
H	Sodium Hydroxide 10% Sodium in water	Sodium Hydroxide	q.s.
I	Tocopherol	Tocopherol	0,5
J	Fragrance	Parfum (EU)/Fragrance (US)	q.s.

Preparation

1. Phase A is heated up to 80°C and phase B is mixed at room temp.
2. Add phase B to phase A
3. Mix phase C at room temp., homogenise and stir for a while
4. Add phase A/B to phase C. Homogenise
6. Add phase D to phase A/B/C
7. Phases E, F + G will be added into the emulsion by stirring
8. Add phase I and J
9. Adjust with phase H to a pH value of 6,5

Supplier

Cremer Care: IMWITOR®, MIGLYOL®

BASF AG: Uvinul®, Tinosorb®

The Lubrizol Corporation: Carbopol®

Agrana Stärke: Mais PO4

Akzo Nobel: Dermacryl®

Light Body Yoghurt No. 685

Cold/Cold Processed

Phase	Tradename	INCI	Amount %
A	IMWITOR® 375	Glyceryl Citrate/Lactate/Linoleate/Oleate	0,5
A	MIGLYOL® Coco 810	Coco Caprylate/Caprata	5,0
A	MIGLYOL® PPG 810	Propylene Glycol Dicaprylate/Dicaprate	6,0
A	WITARIX® MCT 60/40	Caprylic/Capric Triglyceride	2,0
A	Tocopherol	Tocopherol	0,5
B	Glycerin 99,5 %	Glycerin	3,0
B	Carbopol® Ultrez-20	Acrylates/C10-30 Alkyl Acrylate	0,3
B	Phenonip® XB	Phenoxyethanol/Methylparaben/Ethylparaben/Propylparaben	0,7
B	Aqua dem.	Aqua	ad. 100,0
C	Fragrance	Parfum (EU) /Fragrance (US)	q.s.
C	Color		q.s.
D	Sodium Hydroxide 10% in water	Sodium Hydroxide	q.s.

Preparation

1. Prepare this formulation at room temperature
2. Homogenise phase A
3. Incorporate the Carbopol Ultrez-20 in phase B separately under stirring
4. Stir phase A into phase B and homogenise
5. Add phase C and adjust with phase D to a pH value of 6,5

Supplier

IOI Oleo: IMWITOR®, MIGLYOL®, WITARIX®

The Lubrizol Corporation: Carbopol

Clariant: Phenonip®

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IOI Oleo GmbH

Hamburg, Germany | T: +49 40 28 00 31-0 | E: personalcare@ioioleo.de | W: www.ioioleo.de