

**FORMULARY
of
DETERGENTS
and other
CLEANING AGENTS**

A FORMULARY OF DETERGENTS AND OTHER CLEANING AGENTS

Compiled by

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PREFACE

Through the cooperation of the contributors of the major surfactant-producing corporations, we are pleased to present a formulary devoted entirely to a variety of cleaning agents. The purpose of this compilation is not to educate the reader as to the physical and chemical nature of detergent ingredients but to make available a catalogue of formulas reflecting the current technology in the surfactant industry.

The formulas herein should be considered starting-point preparations and thereby used as the basis for further experimentation in the development of new detergent products.

The book is organized so that each chapter deals with major detergent applications. Within each chapter the formulas are further subdivided according to their hydrophilic nature which determines their mode of activity. These four categories are: anionic, nonionic, cationic, and amphoteric.

Unless otherwise specified, all formulas have the quantities of ingredients given in parts by weight. A list of abbreviations that are used throughout the formulary is included. All constituents appearing by their tradename are printed in boldface type, and the manufacturers' names and addresses appear after the list of alphabetized tradenames in the appendix.

ABBREVIATIONS

@	at
approx.	approximately
aq.	aqueous
Be	Baume
C	degrees Centigrade
cc.	cubic centimeter
cm	centimeter
conc.	concentrated
cps	centerpoise(s)
cs	centistoke
F	degrees Fahrenheit
fl. oz.	fluid ounce
ft	foot
g	gram
gal	gallon
h	hour
ht.	height
in.	inch
l.	liter
M	mole
max	maximum
med.	medium
min.	minute
min.	minimum
ml	milliliter
mm.	millimeter
m.p.	melting point
neut.	neutralized
NF	National Formulary
No.	number
O/W	oil in water
oz.	ounce
POE	polyoxyethylene
ppm	parts per million
q.s.	quantity sufficient to make
rpm	revolutions per minute

ABBREVIATIONS

s.	second
sol'n.	solution
Tw.	Twaddell
USP	United States Pharmacopeia
visc.	viscosity
W/O	water in oil
wt.	weight
XXX.	triple pressed
≈	approximately
#	number
%	percent
qt.	quart

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Chapter I

HYGIENIC CLEANERS

Bubble Bath

	Formula No. 1	No. 2	No. 3
		<i>(Anionic)</i>	
Alkasurf T	—	—	20
Alkasurf ES 60	—	5	—
Alkasurf EA 60	16	—	—
Alkasurf ALS	8	10	10
Alkamide CDE	4	3	3
Water	to 100	to 100	to 100
Phosphoric Acid	to pH 7	to pH 7	to pH 7
Preservative	q.s.	q.s.	q.s.
Sodium Chloride	0.5	1.0	1.0
Color and Perfume	q.s.	q.s.	q.s.

Procedure:

While agitating the water, add the ingredients in the above order.

	No. 4	No. 5	No. 6
		<i>(Anionic)</i>	
Alkasurf ES 60	—	—	23
Alkasurf ES 30	—	20	—
Alkasurf T	30	—	—
Alkamide L9DE	10	3	—
Alkamide L7DE	—	—	4.5

2 FORMULARY OF DETERGENTS/CLEANING AGENTS

Water	60	76	71.5
Citric Acid	←———— to pH 7 —————→		
Sodium Chloride	—	1-2	1-2
Preservative	q.s.	q.s.	q.s.
Color and Perfume	q.s.	q.s.	q.s.

Note:

A sparkling clear product can be produced that can be readily perfumed. Should a more economical formulation be required, use **Alkamide CL63**.

	No. 7	No. 8
	<i>(Anionic)</i>	
Neodol® 25-3S (60% AM)	32	32
Lauryldimethylamine Oxide (30% AM)	16	16
Total Actives (100% AM)	24	24
Bubble Bath Fragrance	1	—
Shampoo Fragrance	—	0.3
FD&C Blue No. 1 (1% aq. sol'n.)	0.1	0.1
Water	q.s.	q.s.

No. 9

(Nonionic-Anionic)

A Bio Terge AS-40	40.0
Pationic ISL	3.0
Monamid 716	3.0
Perfume	1.0
B Glydant (40-700)	0.2
Water (deionized)	52.8
pH	7.3
Cloud Point	<-3 C
Clear Point	—

Procedure:

Combine ingredients of Part A. Heating gently will hasten solubility.

Combine ingredients of Part B. Add B to A with agitation. Cool to room temperature if necessary.

	No. 10	No. 11
	<i>(Nonionic-Anionic)</i>	
Alkasurf ALS	10	—
Alkasurf SS LA3	—	15
Alkasurf ES 60	10	15
Alkamide CDO	4	5
Soluble Lanolin	—	2
Sodium Chloride	1.0	1.0
Water	to 100	to 100
Color and Perfume	q.s.	q.s.

Note:

The above formulations contain free glycerin which contributes to the emollient properties of the finished product. The use of the **Alkasurf** sulfo-succinate surfactants offers improved soap and hard water resistance in addition to extra mildness.

No. 12

(Nonionic-Anionic)

Water	84.5
Sodium Chloride	2.5
Standapol® WAQ Spec.	2.0
Standamid® SD (Cocamide DEA)	2.0
Propylene Glycol	1.0
Standapol® ES-40 Conc. (Sodium Myreth Sulfate)	8.0
Perfume Oil	q.s.
Dyes and Preservatives	q.s.

Procedure:

The order of addition is given above. Add all materials singly under adequate agitation. Continue stirring until product is homogeneous.

Note:

This low actives (9%) formula provides copious foam in the tub.

No. 13

(Nonionic-Anionic)

Water	68.5
Sodium Chloride	1.0
Standapol® ES-40 Conc.	20.0
Standamid® LD (premelted at 45 C)	5.0
Standamul® HE	2.5
Standamox® CAW	3.0
Perfume Oil	q.s.
Dyes and Perservatives	q.s.

Procedure:

The order of addition is given above. Add all materials singly under adequate agitation. Continue stirring until product is homogeneous.

Note:

The ethoxylated cocoate provides emolliency. The blend of amide and amine oxide provides a high level of detergency with minimum irritation potential not possible in a strictly high amide blend.

Herbal Bubble Bath**Formula No. 1**

(Nonionic-Anionic)

Water	50.0
Sodium Chloride	2.0
Standapol® WAS-100	20.0
Standapol® ES-7099	20.0
Standamid® SD	2.0
Standamul® OXL	3.0
Sedaplant Richter®	3.0
Perfume Oil	q.s.
Dyes and Preservatives	q.s.

Procedure:

The order of addition is given above. Add all ingredients singly under adequate agitation. Continue stirring until product is homogeneous.

Note:

The blend of propoxylated-ethoxylated fatty alcohol and CLR material provides emollient and substantive dermal effects.

No. 2

(Amphoteric)

Lexaine IBC-70	20.00
Sodium Chloride	0.10
Lexein-X250	1.00
Bronopol	0.02
FD&C Yellow No. 5 (½%)	0.80
FD&C Blue No. 1 (¼%)	0.08
FD&C Red No. 4 (½%)	0.04
Perfume O-115 (UOP)	0.50
Water	77.38

Visc.: Brookfield RVT (#3, 20 rpm, 1 min) = 2000 cps, pH = 4.95

Procedure:

Charge water into a suitable making tank equipped with an agitator and having provisions for heating and cooling. Heat to 70-90 C with moderate agitation. Increase agitator speed and gradually add **Lexaine IBC-70**. When this is all added and completely dissolved, cool with moderate agitation to 40-45 C; then add and disperse balance of ingredients in the order shown. Cool to 25 C and fill.

Emollient Bubble Bath

(Nonionic-Anionic)

Water	29.0
Standapol® ES-2	60.0
Standamul® HE	5.0
Standamid® LD (premelted at 45 C)	3.0

Perfume Oil	3.0
Dyes and Preservatives	q.s.

Procedure:

The recommended order of addition is given above. Add all materials singly under adequate agitation. Continue stirring until product is homogeneous.

Note:

The ethoxylated cocoate provides emollient and substantive dermal effects.

Low Irritation Shampoo**Formula No. 1**

(Nonionic-Anionic-Amphoteric, Conditioning)

Water	48.0
Sodium Chloride	1.0
Standapol® BAW	12.0
Standapol® 130-E	12.0
Standapol® ES-2	20.0
Standamid® SD	2.0
Polyquart® H-7102	5.0
Perfume Oil	q.s.
Dyes and Preservatives	q.s.

Procedure:

The order of addition is given above. Add all materials singly under adequate agitation. Adjust the pH to 7.0 ± 0.5 with 50 percent citric acid aqueous solution. Continue stirring until product is homogeneous.

Note:

Dermal and ocular irritation data available upon request. The blend of betaine and ethoxylated sulfate contributes to low irritation potential. The quaternary provides substantivity and conditioning to the hair shaft.

No. 2

(Nonionic-Anionic-Amphoteric)

Water	45.0
Sodium Chloride	1.0
Standapol® ES-2	20.0
Standapol® 130-E	12.0
Standapol® BAW	15.0
Standamid® SD	2.0
Standamox® CAW	3.0
Standamul® HE	2.0
Perfume Oil	q.s.
Dyes and Preservatives	q.s.

Procedure:

The order of addition is given above. Add all materials singly under adequate agitation. Adjust the pH to 7.0 ± 0.5 with 50 percent citric acid aqueous solution. Continue stirring until product is homogeneous.

Note:

Dermal and ocular irritation data available upon request. The blend of ethoxylated sulfate, betaine, amine oxide and ethoxylated cocoate contributes to low irritation potential while also providing effective detergency.

No. 3

(Nonionic-Anionic-Amphoteric)

Water	56.0
Standapol® AB-45	20.0
Standapol® ES-2	20.0
Standamid® SD	2.0
Standamul® HE	2.0
Perfume Oil	q.s.
Dyes and Preservatives	q.s.

Procedure:

The order of addition is given above. Add all materials singly under adequate agitation. Adjust the pH to 7.0 ± 0.5 with 50 percent citric acid

aqueous solution. Continue stirring until product is homogeneous.

Note:

Dermal and ocular irritation data available upon request. The blend of betaine, anionic, and ethoxylated cocoate contributes to low irritation potential while also providing effective detergency.

No. 4

(Anionic)

Alkateric 2CIB	10-30
Alkasurf ES-60	10-25
Alkamox CAPO	5-10
Preservative	q.s.
Color and Perfume	q.s.
Water	to 100

No. 5

(Anionic)

Alkateric BC	10-30
Alkasurf ES-60	10-25
Alkamide CDE	5-10
Preservative	q.s.
Color and Perfume	q.s.
Water	to 100

No. 6

Lexaine IBC-70	10.00
Ninol 2012 Extra	3.00
Lexgard M	0.15
Lexgard P	0.05
Citric Acid Monohydrate	0.40
Sodium Chloride	0.20
Plurafac C-17	1.00
FD&C Yellow No. 5 (½%)	0.20

FD&C Red No. 4 (½%)	0.03
Perfume 802169 U	0.05
Water	84.92

Visc.: Brookfield RVT (#3, 20 RPM, 1 min) = 475 cps (may be increased by reducing **Plurafac** or increasing sodium chloride content)

pH = 7.05 (may be varied by adjusting citric acid content)

Procedure:

Charge water into a suitable making tank equipped with an agitator and having provisions for heating and cooling. Heat to 85-90 C with moderate agitation. Increase agitator speed and gradually add **Lexaine IBC-70**. When this is all added and completely dissolved, add balance of ingredients except colors and perfume. Cool with continued stirring to 40-45 C, then disperse colors and perfume. Cool to 25 C and fill.

Concentrated Shampoo

Formula No. 1

(Nonionic-Amphoteric)

Ammonium Laureth Sulfate (60%)	15.00
Ammonium Laurylsulfate (30%)	20.00
Cocamide DEA	16.00
Lexaine C	12.00
Ammonium Chloride	4.00
Propylene Glycol	8.00
Lexgard M	0.15
Lexgard P	0.05
Bronopol	0.05
Phosphoric Acid to pH = 6.0	q.s.
Perfume CS 18480 ¹	0.25
Water, Dye	q.s. to 100.00

1:7 Dilutable

¹ Albert Verley