

***WHAT EVERY CHEMICAL
TECHNOLOGIST WANTS
TO KNOW ABOUT...***

***Volume I
EMULSIFIERS AND
WETTING AGENTS***

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Volume I

**EMULSIFIERS AND
WETTING AGENTS**

Compiled by
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Chemical Publishing Co., Inc.
New York, N.Y.

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Chemical Publishing Co., Inc.

ISBN 0-8206-0326-0

Printed in the United States of America

PREFACE

This reference book is the first volume in the set of books entitled WHAT EVERY CHEMICAL TECHNOLOGIST WANTS TO KNOW ABOUT . . . SERIES. This compendium serves a unique function for those involved in the chemical industry—it provides the necessary information for making the decision as to which trademark chemical product is most suitable for a particular application.

The chemicals included in this first book of the series have their major function as emulsifiers, wetting agents, and detergents, however, complete cross-referencing is provided for the multiple functions of all the chemicals.

The first section which is the major portion of each volume contains the most common generic name of the chemicals as the main entry. All these generic entries are in alphabetical order. Synonyms for these chemicals are then listed. The CTFA name appears alongside the appropriate generic name. The structural and/or molecular formula of the chemical is listed whenever possible. The generic chemical is sold under various tradenames and these are listed here in alphabetical order for ease of reference along with their manufacturer in parentheses. The *Category* subheading lists all the possible functions that the chemical can serve. Because of differences in form, activity, etc., individual tradenames of the generic chemical are used in particular applications more frequently. These are delineated in the *Applications* section. The differences in properties, toxicity/handling, storage/handling, and standard packaging are specified in the subsequent sections wherever distinguishing characteristics are known.

The second section of the volume TRADENAME PRODUCTS AND GENERIC EQUIVALENTS helps the user who only knows a chemical by one tradename to locate its main entry in section 1. The user can look up this tradename in this section of the book and be referred to the appropriate, main-entry, generic chemical name.

The third section GENERIC CHEMICAL SYNONYMS AND CROSS REFERENCES provides a way of locating the main entries by knowing only one of the synonyms. If the generic chemical is not in the volume, it will refer you to the volume in which it is contained.

The fourth section TRADENAME PRODUCT MANUFACTURERS lists the full addresses of the companies that manufacture or distribute the tradename products found in the first section.

The following is a list of the six volumes that comprise this series:

Volume I	Emulsifiers and Wetting Agents
Volume II	Dispersants, Solvents and Solubilizers
Volume III	Plasticizers, Stabilizers and Thickeners
Volume IV	Conditioners, Emollients and Lubricants
Volume V	Resins
Volume VI	Polymers and Plastics

This series has been made possible through long hours of research and compilation and the dedication and tireless efforts of Roberta Dakan who helped make this distinctive series possible. Our appreciation is extended to all the chemical manufacturers and distributors who supplied the technical information.

M. and I. Ash

NOTE

The information contained in this series is accurate to the best of our knowledge; however, no liability will be assumed by the publisher for the correctness or comprehensiveness of such information. The determination of the suitability of any of the products for prospective use is the responsibility of the user. It is herewith recommended that those who plan to use any of the products referenced seek the manufacturer's instructions for the handling of that particular chemical.

OTHER BOOKS BY MICHAEL AND IRENE ASH

A Formulary of Paints and Other Coatings, Volumes I and II
A Formulary of Detergents and Other Cleaning Agents
A Formulary of Adhesives and Sealants
A Formulary of Cosmetic Preparations
The Thesaurus of Chemical Products, Volumes I and II
Encyclopedia of Industrial Chemical Additives, Volumes I-IV
Encyclopedia of Surfactants, Volumes I-IV
Encyclopedia of Plastics, Polymers and Resins, Volumes I-III

ABBREVIATIONS

@	.....	at
anhyd.	.....	anhydrous
APHA	.....	American Public Health Association
approx.	.....	approximately
aq.	.....	aqueous
ASTM	.....	American Society for Testing and Materials
avg.	.....	average
B.P.	.....	boiling point
Btu	.....	British thermal unit
C	.....	degrees Centigrade
CAS	.....	Chemical Abstracts Service
cc	.....	cubic centimeter(s)
CC	.....	closed cup
cm	.....	centimeter(s)
cm ³	.....	cubic centimeter(s)
COC	.....	Cleveland Open Cup
compd.	.....	compound, compounded
conc.	.....	concentrated, concentration
cP, cps	.....	centipoise
cs, cSt	.....	centistokes
CTFA	.....	Cosmetic, Toiletry and Fragrance Association
DEA	.....	diethanolamine
disp	.....	dispersible, dispersion
dist	.....	distilled
DOT	.....	Department of Transportation
DW	.....	distilled water
EO	.....	ethylene oxide
equiv.	.....	equivalent
F	.....	degrees Fahrenheit
F.P.	.....	freezing point
FDA	.....	Food and Drug Administration
ft ³	.....	cubic foot, cubic feet
g	.....	gram(s)
gal	.....	gallon(s)
HLB	.....	hydrophile-lipophile balance
insol.	.....	insoluble
IPA	.....	isopropyl alcohol
kg	.....	kilogram(s)
l, L	.....	liter(s)
lb	.....	pound(s)
M.P.	.....	melting point
M.W.	.....	molecular weight
max	.....	maximum
MEA	.....	monoethanolamine
MEK	.....	methyl ethyl ketone
mfg.	.....	manufacture
MIBK	.....	methyl isobutyl ketone
min	.....	minute(s)
min.	.....	mineral, minimum
MIPA	.....	monoisopropanolamine

misc	miscible
ml	milliliter(s)
mm	millimeter(s)
NF	National Formulary
no	number
o/w	oil-in-water
OC	open crucible
PEG	polyethylene glycol
pH	hydrogen-ion concentration
pkgs	packages
PMCC	Pensky Marten closed cup
POE	polyoxyethylene, polyoxyethylated
PPG	polypropylene glycol
pt.	point
R&B	Ring & Ball
RD	Recognized Disclosure
ref.	refractive
rpm	revolutions per minute
R.T.	room temperature
s	second(s)
sol.	soluble, solubility
sol'n.	solution
sp.gr.	specific gravity
SS	stainless steel
std.	standard
SUS	Saybolt Universal seconds
TCC	Taggart closed cup
TEA	triethanolamine
tech.	technical
temp.	temperature
theoret.	theoretical
TLV	threshold limit value
TOC	Taggart open cup
UL	Underwriter's Laboratory
USP	United States Pharmacopoeia
uv, UV	ultraviolet
veg	vegetable
visc.	viscosity, viscous
w/o	water-in-oil
wt	weight
≈	approximately equal to
<	less than
>	greater than
≤	less than or equal to
≥	greater than or equal to

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Ammonium lauryl ether sulfate

SYNONYMS:

Ammonium laureth sulfate (CTFA)

Poly (oxy-1,2-ethanediyl), α -sulfo- ω -(dodecyloxy)-, ammonium salt

STRUCTURE:



where $n = 1-4$

CAS No.:

32612-48-9 (generic)

TRADENAME EQUIVALENTS:

Alkasurf EA-60 [Alkaril]

Carsonol ALES-4, SES-A [Carson]

Cedepal SA-406 [Domtar]

Conco Sulfate 216, WEM, WM [Continental]

Cycloryl MA 330, MA 360 [Cyclo]

Drewpon EKZ [Drew Produtos]

Empicol EAB [Marchon]

Manro ALES 27 [Manro]

Maprofix LES-60A, MB, MBO [Onyx]

Nutrapon AL60, KF3846 [Clough]

Polystep B-11 [Stepan Europe]

Richonol S-1300, S-1300C [Richardson]

Sactipon 20A [Lever Industriel]

Sactol 20A [Lever Industriel]

Sipon 201-20, EA, EA2, EAY [Alcolac]

Standapol EA1, EA2, EA3 [Henkel]

Steol CA-460 [Stepan]

Sterling ES600 [Canada Packers]

Sulfotex OT [Henkel]

Ammonium lauryl ether sulfate (cont'd.)

TRADENAME EQUIVALENTS (cont'd.):

Texapon EA-1, EA-2, EA-3, EA-40 [Henkel/Canada]

Texapon NA [Henkel Argentina]

Tylorol A [Thomas Triantaphyllou S.A.]

Ungerol AM3-60 [Unger Fabrikker AS]

Witcolate S1300C [Witco/Organics]

CATEGORY:

Detergent, wetting agent, surfactant, base, cleansing agent, degreasing agent, dispersant, emulsifier, flash foamer, foam stabilizer, foaming agent, penetrant, solubilizer

APPLICATIONS:

Automobile cleaners: car shampoo (Carsonol SES-A; Cedepal SA-406; Sulfotex OT); tire cleaners (Conco Sulfate 216)

Bath products (Alkasurf EA-60; Carsonol SES-A; Conco Sulfate 216; Empicol EAB; Manro ALES 27; Nutrapon AL60, KF3846; Sipon 201-20, EA, EA2, EAY; Standapol EA1, EA2, EA3; Sterling ES600; Texapon EA-2, EA-3, EA-40; Tylorol A)

Cleansers: (Standapol EA1, EA2)

Cosmetic industry preparations: (Conco Sulfate WM; Empicol EAB; Nutrapon KF3846; Sipon EA, EAY; Witcolate S1300C); shampoos (Alkasurf EA-60; Carsonol SES-A; Cedepal SA-406; Cyclorol MA 330; Drewpon EKZ; Empicol EAB; Manro ALES-27; Maprofix LES-60A; Nutrapon AL60, KF3846; Richonol S-1300C; Sipon 201-20, EAY; Standapol EA1, EA2, EA3; Steol CA-460; Sterling ES600; Texapon EA-1, EA-2, EA-3; Tylorol A; Ungerol AM3-60)

Degreasers: (Cyclorol MA330, MA360; Sterling ES600)

Household detergents: (Carsonol SES-A; Conco Sulfate WM; Richonol S-1300C; Sipon 201-20; Sterling ES600; Sulfotex OT); dishwashing (Alkasurf EA-60; Cedepal SA-406; Maprofix LES-60A; Nutrapon AL60; Richonol S-1300C; Steol CA-460); laundry detergent (Alkasurf EA-60; Cyclorol MA360; Sipon 201-20, EA, EAY); light-duty cleaners (Cyclorol MA330, MA360; Nutrapon AL60); liquid detergents (Carsonol SES-A; Conco Sulfate 216; Maprofix LES-60A; Steol CA-460; Sterling ES600; Sulfotex OT; Ungerol AM3-60); powdered detergents (Sterling ES600)

Industrial applications: dyes (Alkasurf EA-60); textile/leather processing (Conco Sulfate 216)

Industrial cleaners: (Alkasurf EA-60; Carsonol SES-A; Steol CA-460; Sulfotex OT; Witcolate S1300C); all-purpose cleaners (Conco Sulfate 216); metal processing surfactants (Conco Sulfate 216); sanitary supply (Alkasurf EA-60); textile cleaning (Conco Sulfate 216; Steol CA-460); textile processing (Steol CA-460)

Pet shampoos: (Sipon EA, EAY)

Pharmaceutical applications: antiseptic products (Sipon EA, EAY); contraceptive products (Sipon EA, EAY); deodorant preparations (Sipon EA, EAY)

PROPERTIES:

Form:

Liquid (Carsonol SES-A; Conco Sulfate 216; Conco Sulfate WM; Cyclorol MA330,

Ammonium lauryl ether sulfate (cont'd.)

MA-360; Drewpon EKZ; Maprofix LES-60A; Nutrapon AL60, KF3846; Richonol S-1300C; Sactipon 20A; Sactol 20A; Sipon 201-20, EA, EA2; Steol CA-460; Sterling ES600; Texapon EA-40, NA; Tylorol A; Witcolate S-1300C)

Clear liquid (Manro ALES 27)

Clear, slightly visc. liquid (Alkasurf EA-60)

Visc. liquid (Sipon EAY; Standapol EA1, EA2, EA3; Sulfotex OT; Texapon EA-1, EA-2, EA-3)

Paste (Ungerol AM3-60)

Color:

Light amber (Alkasurf EA-60)

Pale yellow (Conco Sulfate 216; Cycloryl MA330, MA360; Manro ALES 27; Steol CA-460; Sulfotex OT; Texapon EA-40)

Water-white (Standapol EA1, EA2, EA3; Texapon EA-1, EA-2, EA-3)

Gardner 3 (Richonol S-1300C)

Odor:

Mild (Manro ALES 27)

Mild, pleasant (Sipon EA)

Typical (Alkasurf EA-60; Conco Sulfate 216)

Composition:

23-24% active (Texapon NA)

23-25% active (Drewpon EKZ)

24-26% active (Texapon EA-2)

24.5-25.5% active (Standapol EA2)

25-27% active (Texapon EA-1)

25.5-26.5% active (Standapol EA1)

26% active (Sipon EAY)

26-28% active (Texapon EA-3)

27% active (Manro ALES 27; Sipon EA)

27-29% active (Cycloryl MA330)

57-60% active (Maprofix LES-60A)

57.5% active (Sterling ES600)

58% active (Alkasurf EA-60)

58-60% active (Cycloryl MA360; Sulfotex OT; Texapon EA-40)

59% active (Polystep B-11; Steol CA-460)

Solubility:

Sol. in water (Alkasurf EA-60; Standapol EA-3; Steol CA-460; Witcolate S1300C)

Density:

8.4 lb/gal (Carsonol SES-A)

8.54 lb/gal (Sulfotex OT)

8.6 lb/gal (Richonol S-1300C)

1.020 g/ml (Standapol EA3)

Sp.gr.:

1.016 (Steol CA-460)

Ammonium lauryl ether sulfate (cont'd.)

1.03 @ 20 C (Manro ALES 27)

1.04 @ 20 C (Alkasurf EA-60)

1.06 @ 25/20 C (Maprofix LES-60A)

Visc.:

67 cps (Steol CA-460)

300 cps (Sipon EA)

2500 cps (Standapol EA1, EA2, EA3)

3000 cps @ 20 C (Manro ALES 27)

Stability:

Stable in hard water (Steol CA-460)

Compatibility:

Compatible with anionics, cationics, most amphoterics, and many natural and synthetic gums (Standapol EA3)

Biodegradable: (Carsonol SES-A, Manro ALES 27, Steol CA-460)

pH:

6.0-7.0 (10% sol'n.) (Standapol EA-3; Sulfotex OT)

6.5-7.0 (5% sol'n.) (Texapon NA)

6.5-7.0 (10% sol'n.) (Carsonol SES-A; Standapol EA-1, EA-2)

6.5-7.5 (Richonol S-1300C)

6.7 (10% sol'n.) (Sipon EA, EAY)

7.0 (1% in dist. water) (Steol CA-460)

Cloud Pt.:

-5 C (Sipon EA)

0 C (Sipon EAY; Standapol EA2)

5 C max. (Standapol EA1, EA3)

10 C (Sulfotex OT)

19 C (Steol CA-460)

< 40 F (Alkasurf EA-60)

70 F (Richonol S-1300C)

TOXICITY/HANDLING:

Releases ammonia at pH > 7 (Sipon EA; Sipon EAY; Steol CA-460)

Irritating to skin and eyes in conc. form; although nontoxic, ingestion should be avoided (Standapol EA3; Sulfotex OT)

STORAGE/HANDLING:

Store in closed containers above 7 C (Standapol EA3; Sulfotex OT)

Combustible liquid (Sulfotex OT)

STD. PKGS.:

45 gal drums or road tankers (Manro ALES 27)

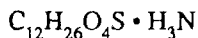
480 lb net fiber drums; bulk, tank wagons, rail cars (Standapol EA3; Sulfotex OT)

Ammonium lauryl sulfate (CTFA)

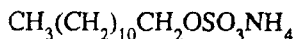
SYNONYMS:

Dodecyl ammonium sulfate
Sulfuric acid, monododecyl ester, ammonium salt

EMPIRICAL FORMULA:



STRUCTURE:



CAS No.:

2235-54-3

TRADENAME EQUIVALENTS:

Akypoal ALS 33 [Chem-Y]
Alkasurf ALS [Alkaril]
Avirol 200 [Henkel]
Carsonol ALS, ALS Special [Carson]
Cedepon LA-30 [Domtar/CDC]
Conco Sulfate A [Continental]
Cycloryl MA [Cyclo]
Drewpon NH, NHAC [Drew Produtos]
Emal AD-25 [Kao Corp.]
Emersal 6430 [Emery]
Empicol AL30 [Albright & Wilson/Australia]
Empicol AL30/T [Albright & Wilson]
Empicol AL70 [Albright & Wilson/Detergents]
Lakeway 101-20 [Bofors Lakeway]
Lonzol LA-300 [Lonza]
Lorol Liquid NH Sulphonated [Ronsheim & Moore]
Manro ALS30 [Manro]
Maprofix NH, NH54, NHL, NHL-22 [Onyx]
Mars AMLS [Mars]
Norfox ALS [Norman, Fox & Co.]
Nutrapon HA 3841 [Clough]
Polystep B-7 [Stepan]
Richonol AM [Richardson]
Sactipon 2A [Lever Industriel]
Sactol 2A [Lever Industriel]
Sermul EA 129 [Servo BV]
Sipon L22, L-22HV [Alcolac]
Standapol A, AMS-100 [Henkel]
Stepanol AM, AM-V [Stepan]
Sterling AM, AM-HV [Canada Packers]
Texapon A [Henkel/Canada]
Texapon A400, Special [Henkel KGaA]

Ammonium lauryl sulfate (cont'd.)

TRADENAME EQUIVALENTS (cont'd.):

Witcolate AM [Witco/Organics]

Zoharpon LAA [Zohar Detergent]

CATEGORY:

Detergent, wetting agent, emulsifier, dispersant, foaming agent base, cleansing agent, solubilizer, surfactant

APPLICATIONS:

Automobile cleaners: car shampoo (Carsonol ALS, ALS Special; Mars AMLS; Stepanol AM, AM-V)

Bath products: bubble bath (Carsonol ALS, ALS Special; Conco Sulfate A; Cycloryl MA; Empicol AL30/T, AL70; Lakeway 101-20; Lonzol LA-300; Maprofix NH, NHL-22; Mars AMLS; Nutrapon HA 3841; Standapol A, AMS-100; Stepanol AM, AM-V; Sterling AM, AM-HV; Texapon A, Special)

Cleansers: (Standapol A, AMS-100; Texapon A); body cleansers (Conco Sulfate A; Emersal 6430); cleansing creams (Carsonol ALS, ALS Special; Mars AMLS; Stepanol AM, AM-V)

Cosmetic industry preparations: (Alkasurf ALS; Empicol AL30/T; Manro ALS30; Sipon L-22HV; Witcolate AM); cosmetic base (Empicol AL70); personal care products (Carsonol ALS, ALS Special; Lakeway 101-20; Lonzol LA-300; Stepanol AM, AM-V); shampoo base (Akyposal ALS 33; Cedepon LA-30; Zoharpon LAA); shampoos (Alkasurf ALS; Carsonol ALS, ALS Special; Conco Sulfate A; Cycloryl MA; Drewpon NH, NHAC; Emersal 6430; Empicol AL30, AL30/T, AL70; Lonzol LA-300; Lorol Liquid NH Sulphonated; Manro ALS 30; Maprofix NH, NHL-22; Mars AMLS; Nutrapon HA 3841; Richonol AM; Sipon L-22, L-22HV; Standapol A, AMS-100; Stepanol AM, AM-V; Sterling AM, AM-HV; Texapon A, Special); shaving preparations (Carsonol ALS, ALS Special; Sipon L-22; Stepanol AM, AM-V)

Farm products: insecticides (Stepanol AM, AM-V)

Food applications: fruit washing (Stepanol AM, AM-V); vegetable scrubber (Carsonol ALS, ALS Special)

Household detergents: (Alkasurf ALS; Cedepon LA-30; Conco Sulfate A; Lonzol LA-300; Sterling AM, AM-HV; Witcolate AM); carpet & upholstery shampoos (Carsonol ALS, ALS Special; Conco Sulfate A; Empicol AL30; Lonzol LA-300; Lorol Liquid NH Sulphonated; Mars AMLS; Norfox ALS; Stepanol AM, AM-V); dishwashing (Mars AMLS); laundry detergent (Emersal 6430); light-duty cleaners (Cycloryl MA; Nutrapon HA 3841); liquid detergents (Carsonol ALS, ALS Special; Stepanol AM, AM-V)

Industrial applications: construction (Avirol 200); dyes (Avirol 200; Sipon L-22); fire fighting (Avirol 200; Lakeway 101-20; Sipon L-22); industrial processing (Lakeway 101-20; Sipon L-22HV); textile/leather processing (Sipon L-22; Stepanol AM, AM-V)

Industrial cleaners (Carsonol ALS, ALS Special; Lonzol LA-300; Maprofix NHL; Mars AMLS; Stepanol AM, AM-V; Witcolate AM); metal processing surfactants

Ammonium lauryl sulfate (cont'd.)

(Stepanol AM, AM-V); railway cleaners (Stepanol AM, AM-V); sanitary supply (Mars AMLS)

Pet shampoos (Carsonol ALS, ALS Special; Sipon L-22)

Pharmaceutical applications: antiseptic soaps (Sipon L-22); vaginal preparations (Sipon L-22)

PROPERTIES:

Form:

Liquid (Akyposal ALS33; Alkasurf ALS; Avirol 200; Cedepon LA-30; Conco Sulfate A; Cycloryl MA; Drewpon NH, NHAC; Emal AD-25; Emersal 6430; Empicol AL30/T, AL70; Lakeway 101-20; Lorol Liquid NH Sulphonated; Maprofix ALS 30, NHL, NHL-22; Norfox ALS; Nutrapon HA3841; Richonol AM; Sactipon 2A; Sactol 2A; Sermul EA129; Sipon L-22HV; Texapon A; Texapon Special; Witcolate AM; Zoharpon LAA)

Clear liquid (Carsonol ALS Special; Mars AMLS; Polystep B-7; Sipon L-22)

Viscous liquid (Carsonol ALS; Lonzol LA-300; Maprofix NH; Standapol A, AMS-100; Stepanol AM; Sterling AM, AM-HV)

Viscous liquid to light gel (Stepanol AM-V)

Clear to slightly hazy, viscous liquid (Manro ALS 30)

Liquid/paste (Empicol AL30)

Color:

Light (Alkasurf ALS; Polystep B-7)

Low (Carsonol ALS)

Light amber (Avirol 200)

Light yellow (Conco Sulfate A; Cycloryl MA; Lakeway 101-2; Manro ALS 30; Mars AMLS; Stepanol AM)

Amber (Empicol AL30)

White (Lakeway 101-20)

Water-white (Standapol A, AMS-100; Texapon A)

Gardner 1 (Emersal 6430)

Gardner 2 (Richonol AM)

Odor:

Low (Carsonol ALS)

Mild (Manro ALS 30)

Pleasant (Conco Sulfate A)

Typical (Alkasurf ALS; Avirol 200)

Composition:

27% active (Alkasurf ALS)

27-28% active (Maprofix NHL-22)

27-29% active (Drewpon NH; Stepanol AM-V)

27-30% active (Lonzol LA-300; Maprofix NH, NHL)

27.5-28.5% active (Sipon L22; Standapol A, AMS-100; Texapon A)

27.7% active (Sterling AM)

28% active (Manro ALS30; Polystep B-7; Sermul EA 129; Sipon L-22HV; Sterling