Industrial Surfactants Electronic Handbook

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Surfactants, or surface active agents, are introduced into a liquid in order to decrease the surface tension and thereby improve the spreading and wetting properties. Surfactants give soaps and detergents their cleaning abilities. Surfactants are used in many other formulations as well. *Industrial Surfactants Electronic Handbook*[1] includes over 16 000 tradename surfactants for industrial applications, manufactured worldwide. General-use surfactants, such as emulsifiers, wetting agents, foaming agents, detergents, dispersants, and solubilizers are included as well as detergent raw materials, defoamers, and antifoaming agents.

The cd-rom version of *Industrial Surfactants Electronic Handbook* was evaluated for this review. This reference may also be installed on one's hard drive from either the cd-rom or floppy disks. The print counterpart is entitled *Handbook of Industrial Surfactants*.[2]

The cd-rom contents are divided into five sections: "Using an Electronic Reference", "Preface", "Tradename Dictionary", "Cross References", and "Manufacturers". "Using an Electronic Reference" is a tutorial for those with little computer experience. The "Preface" summarizes what is on the disk and may be printed out. The "Tradename Dictionary", as its name implies, may be searched by tradename. Each entry references its manufacturer, chemical composition, associated CAS number, general properties, functions, and applications as provided by the manufacturer. Tradename changes may also be searched.

"Cross References" contains the following sections: Generic Chemical-to-Tradename Cross-Reference, CAS-to-Generic Chemical, CAS-to-Tradename, EINECS-to-CAS-to-Generic Chemical, Ionic Classes (Tradenames), HLB-to-Tradenames, and Applications-to-Tradenames. EINECS (European Inventory of Existing Commercial Chemical Substances) assigns a unique number to each chemical substance as does CAS (Chemical Abstracts Service). The ionic class may be used to determine the application for which the surfactant may be employed and is categorized as anionic, cationic, nonionic, or amphoteric. The HLB (hydrophile−lipophile balance) may also be used to determine a suitable application for the surfactant.

The "Manufacturers" section is divided into a Manufacturers Directory and Manufacturer Name Succession. The Manufacturers Directory provides telephone numbers (including fax and telex) and addresses for more than 500 companies, divisions, subsidiaries, and branch offices worldwide. Current manufacturers are given for companies that are no longer producing the surfactants under their former names.

The above indexes are searchable in the print counterpart as well. The real beauty of the cd-rom is the fact that all of the text is searchable, including properties not listed above. For example, one could search for surfactants with a certain specific gravity, viscosity, or flash point. With the cd-rom, one can use Boolean and proximity operators. And, with the cd-rom, one can use hypertext to link the tradename to the generic chemical or to the manufacturer's address and telephone number.

Recently, I was asked to do a literature search on two surfactants, Span 65 and Tween 60. I decided to see if these surfactants were among the 16 000 included on this cd-rom. As it turns out, Span 65 was included, but Tween 60 was not. The generic chemical name for Span 65 is sorbitan stearate, and the information in Chart 1 was given for the generic chemical. Sorbitan stearate has several tradenames associated with it. Each tradename is linked to additional information which may be retrieved by clicking the mouse on that name. The information in Chart 2 is provided for Span 65. One may click on ICI Specialty Chemicals or ICI Surfactants Belgium, the manufacturers of this surfactant, to obtain their addresses and telephone numbers.

Tween 60 was not included on the cd-rom, but Tween 61 was. I suspected that the two might be similar. Each are given as synonyms for poly(oxyethylene) sorbitan monostearate in the Chemical Abstracts Registry File. I then decided

Chart 1

Chemicals-to-Tradenames

Intro Generic Chemicals, Synonyms and Tradenames: **Sorbitan tristearate**

Sorbitan tristearate (CTFA) CAS 26658-19-5; EINECS 247-891-4

Synonyms: STS; Anhydrosorbitol tristearate; Sorbitan trioctadecanoate

Definition: Triester of stearic acid and hexitol anhydrides derived from sorbitol

Empirical: $C_{60}H_{114}O_8$

Uses: Emulsifier for foods, cosmetics, household prods., industrial applics.

Tradenames: Ahco FS-21; Alkamuls® S-65 (formerly Soprofor S/65); Alkamuls® STS; Crill 35; Disponil STS 100 F1; Drewmulse® STS; Emsorb® 2507; Glycomul® TS KFG; Glycomul® TS; Grindtek STS; Hodag STS; Liposorb TS; Lonzest® STS; Montane 65; Nikkol SS-30; Prote-sorb STS; Radiasurf® 7345; Rheodol SP-S30; S-Maz® 65K; Sorbax STS; Span® 65; TS-33-F

Chart 2

DICTIONARY...S's

Tradename Dictionary Span®

Span® 20. [ICI Spec. Chem.; ICI Surf. Belgium] Sorbitan laurate NF; CAS 1338-39-2; nonionic; emulsifier, stabilizer, thickener, lubricant, softener, antistatic agent; foods, pharmaceuticals, cosmetics, cleaning compds., textiles; amber liq.; sol. (@ 1%) in IPA, perchloroethylene, xylene, cottonseed oil, mineral oil; sol. (hazy) in propylene glycol; visc. 4250 cps; HLB 8.6; 100% act.

Span® 40. [ICI Spec. Chem.; ICI Surf. Belgium] Sorbitan palmitate NF; CAS 26266-57-9; nonionic; see Span 20; tan solid; sol. (@ 1%) in IPA, xylene; sol. (hazy) in perchloroethylene; HLB 6.7; pour pt. 48 C; 100% act.

Span® 60, 60K. [ICI Spec. Chem.; ICI Surf. Belgium] Sorbitan stearate NF; CAS 1338-41-6; nonionic; see Span 20; also dispersant for inorganic pigments in thermoplastics; tan solid; sol. (@1%): sol. in IPA; sol. (hazy) in perchloroethylene, xylene; HLB 4.7; pour pt. 53 C; 100% act.

Span® 65. [ICI Spec. Chem.; ICI Surf. Belgium] Sorbitan tristearate; CAS 26658-19-5; nonionic; see Span 20; cream solid; sol. (@ 1%) in IPA, perchloroethylene, xylene; HLB 2.1; pour pt. 53 C; 100% act.

Span® 80. [ICI Spec. Chem.; ICI Surf. Belgium] Sorbitan oleate NF; CAS 1338-43-8; nonionic; w/o emulsifier, oil additive for corrosion inhibition; fiber lubricant and softener; amber liq.; sol. (@ 1%) in IPA, perchloroethylene, xylene, cottonseed and mineral oils; visc. 1000 cps; HLB 4.3.; 100% act.

Span® 85. [ICI Spec. Chem.; ICI Surf. Belgium] Sorbitan trioleate; CAS 26266-58-0; nonionic; see Span 20; amber liq.; sol. (@ 1%) in IPA, perchloroethylene, xylene, cottonseed and mineral oils; visc. 210 cps; HLB 1.8; 100% act.

to consult another reference, *McCutcheon's*.[3] Both Tween 60 and Tween 61 were listed in this reference. Tween 60 is a liquid/gel and has an HLB value of 14.9; Tween 61 is a solid and has an HLB value of 9.6. Even though they are the same generic chemical, they have different properties and are, therefore, used in different applications.

Michael and Irene Ash have spent a number of years compiling the data for the cd-rom and earlier works on surfactants[4,5] and are considered experts in this area. The data on the cd-rom and in their other works should be highly regarded. The cd-rom is highly recommended for those involved in the selection of surfactants for various applications and for those doing research on surfactants. It has many advantages over the print version. However, those interested in surfactants should have as many references works nearby as possible, since each reference work offers at least some information that is not provided in the others.

Minimum system requirements for using the cd-rom include an Intel 286 CPU, EGA Adapter (black and white or 16 color), 2 MB RAM, cd-rom minimum MSCDEX 2.20 or later (NA for WIN NT) (for cd version only), 1 MB hard disk space when run on cd or 20 MB hard disk space when run on hard disk, Windows 3.0 or 3.1 in standard mode, and a mouse (application can be run without a mouse with great difficulty). Recommended system requirements include an Intel 386 or better CPU; VGA, SVGA, 8514, or better Graphics Adapter (256 color or better); 4 MB RAM, 100 MB or larger hard disk, dual-speed cd-rom minimum MSCDEX 2.20 or later (NA for WIN NT), 1 MB hard disk space when run on cd or 20 MB hard disk space when run on hard disk, Windows 3.1 in 386 enhanced mode or Windows NT V3.1, and a mouse. The cd-rom was evaluated on a system with the recommended requirements; access time was fast for searches, and the video display was very clear.

Gower also has the following chemical references available in print and electronic formats: *Gardner's Chemical Synonyms & Trade Names; Cosmetic and Personal Care Products; Food Additives* (due Spring 1995); and *Plastic Additives* (due Summer 1995).

REFERENCES AND NOTES

(1) *Industrial Surfactants Electronic Handbook.* Compiled by Michael and Irene Ash. Published in 1994 by Gower (and distributed by Ashgate Publishing Co.), Old Post Road, Brookfield, VT 05036-9704, (800) 535-9544. The cd-rom costs $250 for a single user. The cost of the network version is dependent on the number of concurrent users: $250 each for 1−10 concurrent users; $200 each for 11−50 concurrent users; and $175 each for 51 or more concurrent users.

(2) *Handbook of Industrial Surfactants: An International Guide to More Than 16,000 Products by Tradename, Application, Composition & Manufacturer.* Compiled by Michael and Irene Ash. Aldershot, Hants, England; Brookfield, VT, Gower, 1993. The book is available for $195. The electronic version is available on $5^1/_4$ inch or $3^1/_2$ inch diskettes for $250. The diskette version is very similar, if not identical, to the cd-rom version described above. When the book and software are purchased together, the package price is $350.

(3) *McCutcheon's Emulsifiers & Detergents*; McCutcheon's Division, Manufacturing Confectioner Pub. Co.: Glen Rock, NJ, 1988.

(4) *Encyclopedia of Surfactants.* Compiled by Michael and Irene Ash; Chemical Publishing Co.: New York, 1980−1985.

(5) *Condensed Encyclopedia of Surfactants (With Chemical Component and Manufacturer Cross Reference).* Compiled by Michael and Irene Ash; Chemical Publishing Co.: New York, 1989.

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