



Table 2-1: Final list of surfactant and precursor molecules included in the SLE project

	Generic Surfactant Family	Substance (REACH) Name	CAS Number	Declared unit - Scope of the Data collection	Trio Members	Confidentiality Model	Comments	No. data collection part.
1	PRECURSOR	C10-13 Linear alkyl benzene (LAB)	67774-74-7	LAB, catalytic alkylation of benzene, 1 ton at plant	SASOL CEPSA Quimica	Only 2 companies involved, therefore the average of LAB production is <u>not to be disclosed</u>	Precursor for HLAS LCI for a mix of DETAL + HF process	2
2	ANIONIC SURFACTANT	C10-13 Linear alkylbenzene sulphonic acid (HLAS)	85536-14-7	HLAS, sulphonation of LAB, 1 ton at plant	SASOL CEPSA Quimica P&G UNILEVER HUNTSMAN	Vertical average of HLAS production process to be disclosed.	Neutralization step to Na-LAS is <u>not</u> included	5
3	PRECURSOR	C12-14 Fatty alcohol (oleo)	80206-82-2	C12-14 fatty alcohol (oleo), hydrogenation of oil, 1 ton at plant	KAO SASOL P&G BASF	Average <u>not</u> disclosed	Precursor for oleo AS, AE2S, AE	4
4	PRECURSOR	C12-15 Fatty alcohol (essentially linear, petro)	740817-83-8	C12-13 fatty alcohol (petro), oxo process, 1 ton at plant	SHELL SASOL BASF	Average <u>not</u> disclosed	Precursor for petro AS, AE2S, AE	3



5	ANIONIC SURFACTANT	C12-14AS (oleo/petro)	85586-07-8	C12-14AS (oleo/petro), sulphonation of C12-14 fatty alcohol (oleo/petro), 1 ton at plant	KAO P&G Solvay	Vertical average for surfactant production disclosed		3
6	ANIONIC SURFACTANT	C12-14E2S (oleo)	68891-38-3	C12-14 E2S, Ethoxylation and sulphation of fatty alcohol, 1 ton at plant	Solvay KAO SASOL Huntsman P&G	Vertical average for surfactant production disclosed		5
7	ANIONIC SURFACTANT	C12-13E2S (petro)	161074-79-9	C12-13 E2S, Ethoxylation and sulphation of fatty alcohol, 1 ton at plant	Solvay KAO SASOL Huntsman P&G	Vertical average for surfactant production disclosed,		5
8	PRECURSOR	Ethylene Oxide	75-21-8	Ethylene oxide, direct oxidation of ethylene, 1 ton at plant	SHELL SASOL AKZO NOBEL	Vertical average disclosed.		3
9	NON-IONIC SURFACTANT	C12-14 AE3	68439-50-9	C12-14 AE3 (C12-14 Alcohol (oleo) Ethoxylate with 3	BASF SASOL	Ethoxylation step average <u>not</u> disclosed.		3



				moles EO per mole), , 1 ton at plant	Akzo Nobel	Vertical average for surfactant production disclosed		
10	NON-IONIC SURFACTANT	C12-14 AE7	68439-50-9	C12-14 AE7 (C12-14 Alcohol (oleo) Ethoxylate with 7 moles EO per mole), 1 ton at plant	BASF SASOL AKZO NOBEL	Ethoxylation step average <u>not</u> disclosed. Vertical average for surfactant production disclosed		3
11	NON-IONIC SURFACTANT	C12-15 AE3	68131-39-5	C12-15 AE3 (C12-15 Alcohol (petro) Ethoxylate with 3 moles EO per mole), 1 ton at plant	BASF SHELL* SASOL	Ethoxylation step average <u>not</u> disclosed. Vertical average for surfactant production disclosed	*Shell collected data via third party ICL	3
12	NON-IONIC SURFACTANT	C12-15 AE7	68131-39-5	C12-15 AE7 (C12-15 Alcohol (petro) Ethoxylate with 7 moles EO per mole), 1 ton at plant	BASF SHELL* SASOL	Ethoxylation step average <u>not</u> disclosed. Vertical average for surfactant production disclosed	*Shell collected data via third party ICL	3
13	PRECURSOR	C16-18 fatty alcohol	67762-27-0	C16-18 fatty alcohol (oleo), hydrogenation of oil, 1 ton at plant	PE	Vertical average disclosed.	Based on palm oil and tallow fat	0



14	NON-IONIC SURFACTANT	C16-18 AE >20	68439-49-6	C16-18 AE>20 (C16-18 Alcohol (oleo) Ethoxylate with >20 moles EO per mole), 1 ton at plant	BASF AKZO NOBEL SASOL EVONIK	Vertical average for surfactant production disclosed		4
15	PRECURSOR	Diethanolamine	111-42-2	Diethanolamine, reaction of ethylene oxide with ammonia, 1 ton at plant	GaBi Databases	Public data + literature research		0
16	NON-IONIC SURFACTANT	Cocamide diethanolamine	68603-42-9	Cocamide diethanolamine, reaction of coconut oil with diethanolamine, 1 ton at plant	EVONIK HUNTSMAN SASOL	Vertical average for surfactant production disclosed		3
17	PRECURSOR	Dimethylamine	124-40-3	Dimethylamine, reaction of methanol with ammonia, 1 ton at plant	GaBi Databases	Public data + literature research		0
18	PRECURSOR	Hydrogen peroxide	7722-84-1	Hydrogen peroxide, anthraquinone process, 1 ton at plant	GaBi Databases	Public data + literature research		0



19	PRECURSOR	Tertiary amine (C12-14 Dimethylamine)	112-18-5	Alkyldimethylamine, reaction of fatty alcohol with ammonia, 1 ton at plant	GaBi Databases	Public data + literature research + partly company specific information. Vertical average not disclosed.		0
20	NON-IONIC SURFACTANT	C12-14 Amine Oxide (C12-C14 Amines, (even numbered) - alkyldimethyl, N-oxides)	308062-28-4	C12-14 (oleo) Amine oxide, oxidation of tertiary amine with hydrogen peroxide, 1 ton at plant	P&G EVONIK AKZO NOBEL Solvay	Vertical average for surfactant production disclosed.		4
(21)	PRECURSOR	Tallow fatty Alcohol	61790-37-2	Production of Tallow fatty alcohol, 1 ton at plant	PE	Public data + literature research	See product number 13	0
22	PRECURSOR	Triethanolamine (TEA)	102-71-6	Triethanolamine (TEA), reaction of ethylene oxide and ammonia, 1 ton at plant	GaBi Databases	Public data + literature research		0
23	PRECURSOR	Dimethylsulphate (DMS)	77-78-1	Dimethylsulphate, production from ethers and sulphur	GaBi Databases	Public data + literature research		0



				<i>trioxide, 1 ton at plant</i>				
24	CATIONIC SURFACTANT	C16-18 TEA-Quat; Fatty acids, C16-18 (even numbered) and C18 unsaturated., reaction products with triethanolamine, di-methyl sulphate-quaternized)	CAS-Nr. 157905-74-3 EG-Nr. 931-203-0 (new description)	C16-18 TEA-Quat (Triethanolamine Ester Quat (oleo)), reactions of fatty acid with <i>Triethanolamine</i> (TEA) and <i>Dimethylsulphate</i> (DMS), 1 ton at plant	KAO EVONIK STEPAN BASF	Vertical average for surfactant production disclosed	Source of fatty acid is tallow.	4
25	PRECURSOR	<i>Coconut fatty acid methylester</i>		<i>Production of Coconut FAME, 1 ton at plant</i>	PE	<i>Public data + literature research</i>		0
26	PRECURSOR	DMAPA	109-55-7	<i>DMAPA, continuous aminolysis, 1 ton at plant</i>	PE	<i>Public data + literature research</i>		0
27	PRECURSOR	<i>Chloroacetic acid</i>	79-11-8	<i>Chloroacetic acid, catalyzed chlorination of acetic acid, 1 ton at plant</i>	GaBi Databases	<i>Public data + literature research</i>		0
28	AMPHOTERIC SURFACTANT	C8-18 Alkyl amidopropyl betaine	CAS-Nr. none; EG - 931-296-8	C8-18 Alkyl amidopropyl betaine, reaction of alkyl	Solvay EVONIK	Vertical average for surfactant production disclosed.		3



		(1-Propanaminium, 3-amino-n-(carboxymethyl)-n,n-dimethyl-, N-C8-18(even numbered) acyl derivs.), hydroxides, inner salts;	(new description)	chain source with DMAPA (N,N-Dimethylaminopropyl acrylamide) and reaction with Chloroacetic acid and NaOH, 1 ton at plant	-BASF			
29	PRECURSOR	Cumene	98-82-8	Cumene, alkylation of benzene with propene, 1 ton at plant	PE	Public data + literature research		0
30	ANIONIC SURFACTANT - HYDROTROPE	Sodium cumene sulphonate	28348-53-0	Sodium cumene sulphonate, sulphonation of cumene, 1 ton at plant	HUNTSMAN SASOL STEPAN	Vertical average for surfactant production disclosed.		3
31	PRECURSOR	AEEA (aminoethylethanolamine) - precursor for amphotoacetates	111-41-1	AEEA, hydrogenative amination of monoethylene glycol, 1 ton at plant	PE	Public data + literature research		0
32	AMPHOTERIC SURFACTANT	Sodium Cocoamphoacetate (Reaction products of 1H-Imidazole-1-ethanol, 4,5-dihydro-, 2-(C7-C17	68390-66-9	Amphoacetate, carboxymethylation of fatty imidazolines, 1 ton at plant	Solvay EVONIK HUNTSMAN	Vertical average for surfactant production disclosed.		3



		odd numbered, C17-unsatd. alkyl) derivates and sodium hydroxide and chloroacetic acid)						
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Figure 2-6 gives a top level illustration of the material processes included in the study for each surfactant/precursor considered (extension of [Stalmans 1995]). The substances evaluated in the study are shown in bold. The substances where primary data was collected are additionally marked in green. In comparison to the previous study in 1995, the following surfactants are not considered in the present study: SAS, Soap and APG