

Appendix B

Characterization of the Substances Tested in the BCOP Test Method

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Appendix B1

Chemical and Product Classes of Substances Tested in the BCOP Assay

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Chemical and Product Classes of Substances Tested in the BCOP Assay

Substance	CASRN ¹	Chemical Class	Product Class
1-1 (#1)	-	Formulation	Insect repellent
1-2 (#2)	-	Formulation	Insect repellent
1-3 (#3)	-	Formulation	Insect repellent
2-4 (#4)	-	Formulation	Insect repellent
2-7 (#7)	-	Formulation	Insect repellent
2-8 (#8)	-	Formulation	Insect repellent
Acetone	67-64-1	Ketone	Solvent; Antiseptic; Chemical intermediate; Raw material
Alkyl phosphoric acid ester/amine salt	-	Organic salt, Ester, Amine	Petroleum product
All Purpose Cleaner (#5)	-	Formulation	Cleaner
All Purpose Cleaner (#7)	-	Formulation	Cleaner
Allyl alcohol	107-18-6	Alcohol	Pesticide
Aluminum hydroxide	21645-51-2	Alkali, Aluminum compound	Chemical intermediate, Dessicant
2-Aminophenol	95-55-6		Chemical intermediate
Ammonium nitrate	6484-52-2	Inorganic salt, Onium compound	Fertilizer; Chemical intermediate; Industrial explosive
Amway all fabric bleach	-	Formulation	Detergent
Amway automatic dishwashing compound for soft water	-	Formulation	Detergent
Amway automatic dishwashing compound, standard formula	-	Formulation	Detergent
Amway concrete floor cleaner	-	Formulation	Cleaner
Amway Dish Drops dishwashing liquid	-	Formulation	Detergent
Amway dry chlorine bleach	-	Formulation	Bleach
Amway fabric softener	-	Formulation	Fabric softener
Amway Kool Wash delicate fabric detergent	-	Formulation	Detergent
Amway LOC all purpose cleaner	-	Formulation	Cleaner
Amway prewash liquid	-	Formulation	Detergent
Amway Pursue disinfectant cleaner	-	Formulation	Cleaner
Amway Redu dye stain remover	-	Formulation	Stain remover
Amway SA8 laundry liquid	-	Formulation	Detergent
Amway SA8 limited phos laundry powder	-	Formulation	Detergent
Anthracene	120-12-7	Polycyclic	Dye manufacturing agent
Anti-Dandruff Shampoo (HZY) 100%	-	Formulation	Surfactant-containing formulation

Chemical and Product Classes of Substances Tested in the BCOP Assay

Substance	CASRN ¹	Chemical Class	Product Class
Aromatic hydrocarbon #1	-	Hydrocarbon (cyclic)	Solvent/industrial chemical; Petrochemical product
Aromatic hydrocarbon #2	-	Hydrocarbon (cyclic)	Solvent/industrial chemical; Petrochemical product
Aryl phosphonates	-	Not classified	Lubricant additive; Petrochemical product
L-Aspartic acid	70-47-3	Amino acid	Organic intermediate; Fungicides; Germicides
Baby Shampoo No. 1 (HZP)	-	Formulation	Surfactant-containing formulation
Baby Shampoo No. 2 (HZF)	-	Formulation	Surfactant-containing formulation
Bathroom Cleaner (#6)	-	Formulation	Cleaner
Benchmark-Group 1 (#12)	-	Formulation	Insect repellent
Benchmark-Group 2 (#13)	-	Formulation	Insect repellent
Benzalkonium chloride (100%)	8001-54-5	Onium compound	Surfactant (cationic); Bactericide; Fungicide; Preservative
Benzalkonium chloride (1 %)	8001-54-5	Inorganic salt, Onium compound	Fertilizer; Chemical intermediate; Industrial explosive
Benzalkonium chloride (10%)	8001-54-5	Onium compound	Surfactant (cationic); Bactericide; Fungicide; Preservative
Benzalkonium chloride (5%)	8001-54-5	Onium compound	Surfactant (cationic); Bactericide; Fungicide; Preservative
Benzethonium chloride	121-54-0	Amine, Onium compound	Bactericide
Benzoyl-L-tartaric acid	2743-38-6	Carboxylic acid, Ester	Optical resolution agent
Betaine monohydrate	590-47-6	Amino acid, Onium compound	Not classified
BRIJ-35	9002-92-0	Alcohol	Emulsifier
4-Bromophenetole	589-10-6	Ether	Not classified
Bubble Bath (HZK) 100%	-	Formulation	Surfactant-containing formulation
n-Butanol	71-36-3	Ketone	Solvent; Synthetic flavor; Drycleaning
2-Butoxyethanol	111-76-2	Alcohol	Solvent
Butyl acetate	123-86-4	Ester	Solvent; Synthetic flavor ingredient
Butyl cellosolve	111-76-2	Alcohol, Ester	Solvent
Butyrolactone	96-48-0	Lactone, Heterocycle	Synthetic intermediate; Solvent
gamma-Butyrolactone	96-48-0	Heterocyclic, Lactone	Synthetic intermediate; Solvent
Captan 90 concentrate	133-06-2	Imide, Organic sulfur compound	Pesticide
4-Carboxybenzaldehyde	619-66-9	Carboxylic acid, Aldehyde	Not classified
Carboxylic acid amides	-	Formulation	Lubricant additive; Petrochemical product
Cetylpyridinium bromide (0.1%)	140-72-7	Heterocyclic, Onium compound	Surfactant (cationic); Germicide; Laboratory reagent
Cetylpyridinium bromide (1%)	140-72-7	Surfactant, cationic	Germicide; Laboratory reagent

Chemical and Product Classes of Substances Tested in the BCOP Assay

Substance	CASRN ¹	Chemical Class	Product Class
Cetylpyridinium bromide (10%)	140-72-7	Heterocyclic, Onium compound	Surfactant (cationic); Germicide; Laboratory reagent
Cetylpyridinium bromide (6%)	140-72-7	Heterocyclic, Onium compound	Surfactant (cationic); Germicide; Laboratory reagent
Chlorhexidine	55-56-1	Amine/Amidine	Disinfectant; Mouthwash; Anti-infective agent
2-Chloro-2,4,4-trimethylpentane	-	Hydrocarbon (halogenated)	Solvent/industrial chemical; Petrochemical product
Clarified slurry oil	-	Hydrocarbon (cyclic)	Petrochemical product
Cleaner/Degreaser (#13)	-	Formulation	Cleaner
Cleansing Gel (HZQ) 100%	-	Formulation	Surfactant-containing formulation
Cutting fluid (conc.) #1	-	Formulation	Cutting fluid; Petrochemical product
Cutting fluid (conc.) #2	-	Formulation	Cutting fluid; Petrochemical product
Cyclohexanol	108-93-0	Alcohol	Solvent; Chemical intermediate
Cyclohexanone	108-94-1	Ketone, Hydrocarbon (cyclic)	Solvent, Chemical intermediate
Degreaser (#16)	-	Formulation	Degreaser
Deoxycholic acid, sodium salt	302-95-4	Alcohol, Carboxylic acid (salt)	Detergent/Surfactant, Chemical intermediate
Diacetone alcohol	123-42-2	Ketone, Alcohol	Solvent
Dibenzyl phosphate	1623-08-1	Ester, Organophosphorus compound	Not classified
2,6-Dichlorobenzoyl chloride	4659-45-4	Acyl halide	Anti-infective; Anti-fungal; Preservative
2,4-Dichloro-5-sulfamoylbenzoic acid	2736-23-4	Amide, Organic sulfur compound	Intermediate for pharmaceuticals, pesticides, perfumes
2,4-Difluoronitrobenzene	446-35-5	Acyl halide	Anti-infective; Anti-fungal; Preservative
1,3-Diisopropylbenzene	99-62-7	Hydrocarbon (cyclic)	Not classified
Dimethylbiguanide	657-24-9	Amidine	Pharmaceutical
2,2-Dimethylbutanoic acid	595-37-9	Carboxylic acid	Pharmaceutical metabolite
2,5-Dimethylhexanediol	110-03-2	Alcohol	Intermediate for pharmaceuticals, pesticides, perfumes
Dimethyl sulfoxide	67-68-5	Organic sulfur compound	Solvent
Dodecane	112-40-3	Hydrocarbon (acyclic)	Not classified
EDTA, di-potassium salt	25102-12-9	Amine, Carboxylic acid (salt)	Chelator
Ethanol	64-17-5	Alcohol	Solvent; Beverages; Antifreeze agent
Ethanol (#14)	64-17-5	Alcohol	Solvent
2-Ethoxyethanol	110-80-5	Alcohol	Solvent
Ethyl acetate	141-78-6	Ester	Solvent; Synthetic flavoring
Ethyl acetoacetate	141-97-9	Carboxylic acid, Ketone	Chemical intermediate, Flavoring agent
2-Ethylhexanol	104-76-7	Alcohol	Intermediate for pharmaceuticals, pesticides, perfumes
2-Ethyl-1-hexanol	104-76-7	Alcohol	Solvent; Plasticizer

Chemical and Product Classes of Substances Tested in the BCOP Assay

Substance	CASRN ¹	Chemical Class	Product Class
Ethylhexyl acid phosphate ester	-	Ester, Carboxylic acid	Lubricant additive; Petrochemical product
5-Ethylidene-2-norbornene	16219-75-3	Not classified	Solvent/industrial chemical; Petrochemical product
Ethyl-2-methylacetoacetate	609-14-3	Ketone, Ester	Not classified
3-Ethyltoluene	620-14-4	Hydrocarbon (cyclic)	Not classified
Ethyl trimethyl acetate	3938-95-2	Ester	Solvent
Eye Make-Up Remover (HZH) 100%	-	Formulation	Surfactant-containing formulation
Facial Cleaning Foam (HZR) 25%	-	Formulation	Surfactant-containing formulation
Facial Cleanser (HZZ) 100%	-	Formulation	Surfactant-containing formulation
Floor Cleaner (#10)	-	Formulation	Cleaner
Floor Cleaner (#2)	-	Formulation	Cleaner
Floor Stripper (#14)	-	Formulation	Floor stripper
Floor Stripper (#17)	-	Formulation	Floor stripper
Floor Stripper (#18)	-	Formulation	Floor stripper
Foam Bath (HZZ) 100%	-	Formulation	Surfactant-containing formulation
Fomesafen	72128-02-0	Imide, Ether, Nitro compound	Pesticide
Furan	110-00-9	Heterocyclic	Chemical intermediate
Gel Cleanser (HZE) 100%	-	Formulation	Surfactant-containing formulation
General Cleaner (#11)	-	Formulation	Cleaner
General Cleaner (#12)	-	Formulation	Cleaner
Glass Cleaner (#19)	-	Formulation	Cleaner
Gluconolactone	90-80-2	Carboxylic acid, Lactone, Carbohydrate	Food additive
DL-Glutamic acid	19285-83-7	Amino acid	Not classified
Glycerol	56-81-5	Alcohol	Solvent; Plasticizer; Lubricant; Emollient; Drug vehicle
3-Glycidoxypropyltrimethoxysilane	2530-83-8	Organosilicon compound	Adhesive
Hand Soap (HZU) 25%	-	Formulation	Surfactant-containing formulation
Heavy Duty Cleaner (#15)	-	Formulation	Cleaner
Heavy Duty Cleaner/Degreaser (#9)	-	Formulation	Cleaner
Hexadecyltrimethylammonium bromide	57-09-0	Organic salt, Onium compound	Agricultural chemical; Germicide; Drug/Therapeutic agent
1,5-Hexadiene	592-42-7	Hydrocarbon (acyclic)	Not classified
Hexane	110-54-3	Hydrocarbon (acyclic)	Solvent
n-Hexanol	111-27-3	Alcohol	Solvent; Chemical intermediate; Synthetic flavor ingredient
Imidazole	288-32-4	Heterocyclic	Anti-fungal; Enzyme inhibitor
Iminodibenzyl	494-19-9	Heterocyclic	Personal care product

Chemical and Product Classes of Substances Tested in the BCOP Assay

Substance	CASRN ¹	Chemical Class	Product Class
Isobutanol	78-83-1	Alcohol	Solvent; Chemical intermediate; Flavor ingredient
Isopropanol	67-63-0	Alcohol	Solvent; Aerosol formulations (ingredient)
N-Lauroylsarcosine, sodium salt	7631-98-3	Amide, Amino acid (salt)	Surfactant (anionic)
Laurylsulfobetaine	14933-08-5	Amine, Onium compound	Detergent, Surfactant (zwitterionic)
Liquid Soap No. 2 (HZW) 25%	-	Formulation	Surfactant-containing formulation
Liquid Soap No. 1 (HZB) 25%	-	Formulation	Surfactant-containing formulation
Magnesium carbonate	56378-72-4	Inorganic salt	Chemical intermediate
Maneb	12427-38-2	Amine/Amidine, Organic salt, Urea compound	Pesticide
Meat Room Degreaser (#3)	-	Formulation	Degreaser
2-Mercaptopyrimidine	1450-85-7	Acyl halide	Anti-infective; Anti-fungal; Preservative
Metal Cleaner (#20)	-	Formulation	Cleaner
Methanol	67-56-1	Alcohol	Solvent
2-Methoxyethanol	109-86-4	Alcohol	Solvent; Plasticizer
Methyl acetate	79-20-9	Ester	Solvent; Chemical intermediate; Synthetic flavor ingredient
Methyl cyanoacetate	105-34-0	Ester, Nitrile compound	Adhesive; Pharmaceutical intermediate
Methyl cyclopentadiene dimer	-	Cyclic hydrocarbon	Solvent/industrial chemical; Petrochemical product
Methylcyclopentane	96-37-7	Ketone	Solvent; Manufacture of lacquers, varnishes, cosmetics, pharmaceuticals
Methyl ethyl ketone	78-93-3	Ketone	Solvent; Manufacture of lacquers, varnishes, cosmetics, pharmaceuticals
Methyl isobutyl ketone	108-10-1	Ketone	Solvent; Synthetic flavor; Drycleaning
1-Methylpropyl benzene	135-98-8	Hydrocarbon (cyclic)	Not classified
Mild Shampoo (HZJ) 25%	-	Ketone	Solvent; Synthetic flavor; Drycleaning
MYRJ-45	-	Ketone	Solvent; Manufacture of lacquers, varnishes, cosmetics, pharmaceuticals
1-Naphthalene acetic acid	86-87-3	Carboxylic acid, Polycyclic compound	Pesticide
1-Naphthalene acetic acid, Na salt	61-31-4	Carboxylic acid (salt), Polycyclic compound	Pesticide
1-Nitropropane	108-03-2	Hydrocarbon (acyclic), Nitro compound	Solvent, Chemical intermediate
n-Octanol	111-87-5	Alcohol	Solvent; Fragrance
Parafluoriline	371-40-4	Amine/Amidine	Intermediate for herbicides; Dyes
2,4-Pentanedione	123-54-6	Ketone	Solvent; Plasticizer
Petroleum ether	8032-32-4	Hydrocarbon (acyclic)	Solvent
Petroleum wax	-	Wax	Petrochemical product

Chemical and Product Classes of Substances Tested in the BCOP Assay

Substance	CASRN ¹	Chemical Class	Product Class
Phenylbutazone	50-33-9	Heterocyclic	Pharmaceutical
1-Phenyl-3-pyrazolidone	92-43-3	Heterocyclic	Photographic agent
Polishing Scrub (HZZ) 100%	-	Formulation	Surfactant-containing formulation
Polyalkenylsuccinate ester/amine salt	-	Amidine	Lubricant additive; Petrochemical product
Polyethylene glycol 400	25322-68-3	Alcohol, Polyether	Surfactant (nonionic), Lubricant, Plasticizer, Solvent
Polyethylene glycol 600	-	Alcohol, Polyether	Surfactant (nonionic)
Pot and Pan Cleaner (#8)	-	Formulation	Cleaner
Potassium cyanate	590-28-3	Inorganic salt	Herbicide; Pharmaceutical intermediate
Process oil	-	Oil	Petrochemical product
Promethazine hydrochloride	58-33-3	Amine/Amidine, Heterocyclic, Organic sulfur compound	Antihistamine; Anti-nausea drug
Propylene glycol	57-55-6	Alcohol	Solvent
Propyl-4-hydroxybenzoate	94-13-3	Carboxylic acid, Phenol	Antimicrobial
Pyridine	110-86-1	Heterocyclic	Solvent; Intermediate for pharmaceuticals, dyes, pesticides
Quinacrine	69-05-6	Heterocyclic	Drug/Therapeutic agent
Shampoo No. 1 (HZC) 25%	-	Formulation	Surfactant-containing formulation
Shampoo No. 2 (HZZ)	-	Formulation	Surfactant-containing formulation
Shampoo No. 3 (HZM) 25%	-	Formulation	Surfactant-containing formulation
Shampoo No. 4 (HZV) 25%	-	Formulation	Surfactant-containing formulation
Shampoo No. 5 (HZD) 25%	-	Formulation	Surfactant-containing formulation
Shampoo No. 6 (HZN) 25%	-	Formulation	Surfactant-containing formulation
Shampoo No. 7 (HZA)	-	Formulation	Surfactant-containing formulation
Shampoo No. 8 (HZG) 25%	-	Formulation	Surfactant-containing formulation
Shower Gel (HZZ) 100%	-	Formulation	Surfactant-containing formulation
Skin Cleanser (HZI) 100%	-	Formulation	Surfactant-containing formulation
Sodium hydroxide (1%)	1310-73-2	Alkali	Caustic agent
Sodium hydroxide (10%)	1310-73-2	Alkali	Caustic agent
Sodium lauryl sulfate (15 %)	151-21-3	Carboxylic acid (salt)	Surfactant (anionic); Detergent
Sodium lauryl sulfate (3 %)	151-21-3	Carboxylic acid (salt)	Surfactant (anionic); Detergent
Sodium lauryl sulfate (30 %)	151-21-3	Carboxylic acid (salt)	Surfactant (anionic); Detergent
Sodium oxalate	62-76-0	Carboxylic acid (salt)	Textile finishing; Pyrotechnic, Industrial byproduct
Sodium perborate	10486-00-7	Inorganic salt, Boron compound	Household cleaner; Detergent

Chemical and Product Classes of Substances Tested in the BCOP Assay

Substance	CASRN ¹	Chemical Class	Product Class
Tetraaminopyrimidine sulfate	5392-28-9	Amine, Heterocycle, Inorganic salt	Not classified
Thiadiazole alkyl derivative	-		Lubricant additive; Petrochemical product
Thiourea	62-56-6	Organic sulfur compound	Photographic agent; Flame-retardant; Chelation reagent and catalyst; Chemical intermediate; Pesticide; Drug/Therapeutic agent
Toilet Bowl Cleaner (#1)	-	Formulation	Cleaner
Toilet Bowl Cleaner (#4)	-	Formulation	Cleaner
Toluene	108-88-3	Hydrocarbon (cyclic)	Solvent
Trichloroacetic acid (3%)	76-03-9	Carboxylic acid	Caustic agent; Fixative; Herbicide
Trichloroacetic acid (30%)	76-03-9	Carboxylic acid	Caustic agent; Fixative; Herbicide
1,2,3-Trichloropropane	96-18-4	Hydrocarbon (halogenated)	Solvent
Triethanolamine	102-71-6	Amine, Alcohol	Antimicrobial, Chemical intermediate
1,2,4-Trimethylbenzene	95-63-6	Hydrocarbon (cyclic)	Chemical intermediate
Triton X-100 (1%)	9002-93-1	Ether	Surfactant (nonionic)
Triton X-100 (10 %)	9002-93-1	Ether	Surfactant (nonionic), Detergent, Emulsifier
Triton X-100 (5%)	9002-93-1	Ether	Surfactant (nonionic)
Triton X-155	9010-44-0	Ether	Surfactant (nonionic)
Tween 20	9005-64-5	Ester, Polyether	Surfactant (nonionic); Detergent
Xylene	1330-20-7	Hydrocarbon (cyclic)	Agricultural chemical

¹CASRN = Chemical Abstracts Service Registry Number

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Appendix B2

Components of Formulations Tested in Gettings et al. (1996)

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Components of Formulations Tested in Gettings et al. (1996)

Formulation	Formulation Components	% (W/W)	Formulation	Formulation Components	% (W/W)
HZA-Shampoo No. 7	Water	53.86	HZN-Shampoo No. 6	Water	44.381
	Sodium lauryl sulfate (30%)	25.00		Sodium laureth (2EO) sulfate (28%)	43.634
	Disodium laureth sulfocuccinate (40%)	15.00		Cocamidopropyl betaine (30%)	11.760
	Lauramide DEA	0.50		Tetrasodium EDTA	0.125
	Butylene glycol	5.00		Formalin	0.100
	Methyl and propylparabens	0.25			
	Carageenan	0.35			
	Methyl and methylchloroisothiazolinone	0.04			
HZB-Liquid Soap No. 1	Water and volatiles	65-85	HZP-Baby Shampoo No. 1	Water	49.54
	Ammonium lauryl sulfate	1-10		PEG-80 sorbitan laurate (50%)	23.60
	Sodium laureth sulfate	1-10		Sodium trideceth sulfate (50%)	17.40
	Lauramide DEA	1-10		Lauroamphocarboxyglycinate (50%)	5.40
	Glycerine	1-10		PEG-150 distearate (50%)	5.00
	Isosteamidopropyl morpholine lactate	0.1-1.0		Cocamidodrolyl hydroxysultane (50%)	4.00
	Disodium ricinoleamido MEA-sulfosuccinate	0.1-1.0		Sodium laureth-13 carboxylate (50%)	1.00
	DMDM hydantoin	0.1-1.0		Quaternium 15	0.03
	Citric acid	0.1-1.0		Benzyl alcohol	0.05
	Triclosan	0.1-1.0		FD&C Yellow No. 5 (1.0%)	0.25
	Tetrasodium EDTA	<0.1		FD&C Yellow No. 6 (1.0%)	0.05
	FD&C Yellow No. 5	<0.1		Citric acid	0.08
	FD&C Red No. 4	<0.1			
HZC-Shampoo No. 1	Water	14.037	HZQ-Cleansing Gel	Water	68.93
	Laurylamidopropyl betaine (30%)	60.000		Lauroamphocarboxyglycinate (25%)	10.40
	Cetrimonium chloride	16.000		Sodium trideceth sulfate (16%)	10.60
	PEG-3 cocamide	4.500		TEA-lauryl sulfate (40%)	3.50
	Citric acid	3.500		Lauramide DEA	0.50
	Sodium chloride	1.000		PEG-150 distearate	2.80
	Ditallowdimonium chloride (73%)	0.700		Propylene glycol	1.40
	Lauryl alcohol	0.250		Hexylene glycol	1.05
	Methyl and chlorisothiazolinone (1.5%)	0.033		Citric acid	0.28
				Diazolidinyl urea	0.20
		Methylparaben	0.20		
		Sodium citrate	0.14		
HZD-Shampoo No. 5	Water	54.120	HZR-Facial Cleansing Foam	Water	32.97
	Sodium laureth sulfate (26%)	38.00		Sodium cocoyl isethionate	20.00
	Cocamide DEA	3.000		Sodium lauroyl sarcosinate (30%)	25.00
	Cocamide propyl betaine (37%)	1.750		PPG-5-ceteth-10 phosphate	4.00
	Disodium EDTA	0.050		Linoleamide DEA	2.00
	Methylparaben	0.150		Sorbitol (70%)	2.75
	Propylparaben	0.100		Glycol stearate	5.50
	Citric acid	0.250		Glycerin	2.00
	FD&C Yellow No. 5 (1%)	0.050		Diglycerol	2.00
	D&C Red No. 33 (0.5%)	0.015		Cetearyl alcohol	2.75
	DMDM hydantoin (54%)	0.300		Mineral oil	0.50
	BHT	0.050		Methylparaben	0.15
	Sodium glutamate	2.000		Propylparaben	0.10
Sodium chloride	0.170	Trisodium EDTA	0.10		
		Beeswax	0.10		
		Ceresin	0.06		
		Sodium borate	0.02		
HZE-Gel Cleanser	Water	59.974	HZZ-Shower Gel	Water	27.567
	Acylglutamate CT-12 (30%)	15.000		Sodium lauroyl sarcosinate (30%)	25.000
	Cocamphodiacetate (50%)	15.000		Laurimidopropyl betaine (30%)	25.000
	Sodium nonoxynol-6 phosphate (88.5%)	6.000		Cocamidopropyl hydroxysultaine (50%)	15.000
	Quaternium-26 (58%)	1.500		Linoleamide DEA	4.500
	PEG-120-methyl glucose diolate	1.500		Glycol stearate	1.000
	Citric acid	0.100		Polyquaternium-2	1.000
	Sodium citrate	0.500		Phosphoric acid (86.5%)	0.600
	Disodium EDTA	0.050		Tetrasodium EDTA	0.200
	Methylparaben	0.150		BHT	0.050
	DMDM hydantoin (55%)	0.200		PPG-12-buteth-16	0.050
	FD&C Yellow No. 10 (1%)	0.001		Methyl and chlorisothiazolinone (1.5%)	0.033
	D&C Blue No. 1 (0.746%)	0.025			
HZF-Baby Shampoo No. 2	Water	57.653	HZT-Polishing Scrub	Water	33.85
	Sodium laureth (2EO) sulfate (28%)	21.430		Mineral oil	10.00
	Disodium laureth-3-sulfosuccinate (40%)	9.090		Lauroamphocarboxyglycinate (25%)	8.80
	Cocamidopropyl betaine (30%)	10.000		Sodium trideceth sulfate (16%)	9.40
	Lauramide DEA	1.500		Petrolatum	6.60
	Kathon CG (1.5%)	0.067		Isopropyl palmitate	6.60
	Tetrasodium EDTA (30%)	0.260		Propylene glycol	5.00
		Cetyl palmitate		4.40	
		Glyceryl stearate and PEG-100 stearate		4.40	
		Aluminum silicate		3.00	
		Cetyl alcohol		2.50	
		Polypropylene		2.50	
		Magnesium aluminum silicate		1.00	
		Titanium dioxide	0.50		
		Hexylene glycol	0.40		
		Imidazolidinyl urea	0.30		
		Methylparaben	0.30		
		Lactic acid	0.25		
		Propylparaben	0.20		

Components of Formulations Tested in Gettings et al. (1996)

Formulation	Formulation Components	% (W/W)	Formulation	Formulation Components	% (W/W)
HZG-Shampoo No. 8	Water	48.43	HZU-Hand Soap	Water	37.95
	Sodium laureth sulfate (28%)	20.00		Sodium C14-16 olefin sulfonate (36%)	20.25
	Sodium lauryl sulfate (30%)	25.00		Sodium lauroyl sarcosinate	20.00
	Lauramide-DEA	5.00		Cocamidopropyl hydroxysulfate	8.00
	Hydroxyethyl tallow glycinate	1.00		Propylene glycol	3.00
	Citric acid	0.20		Glycerol stearate	3.00
	PEG-45M	0.20		PPG-12-PEG-50 lanolin	3.00
	Methyl and propylparabens	0.13		Polyquaternium-7	2.00
	Methyl and chloromethyl-isothiazolinone	0.04		Citric acid	1.00
HZH-Eye Make-Up Remover	Water	96.242	HZV-Shampoo No. 4	Water	80-90
	Sodium laureth sulfate (21%)	0.900		Ammonium lauryl sulfate	5-10
	Cocamphocarboxyglycinate (40%)	1.100		Lauramide DEA	1-5
	Hexylene glycol	1.000		Cocamidopropyl sulfate	<1.0
	Dipotassium phosphate	0.394		Ammonium chloride USP	<1.0
	Potassium phosphate	0.102		Citric acid	<1.0
	Allantoin	0.050		DMDM hydantoin	<1.0
	Methyl paraben	0.150		Tetrasodium EDTA	<1.0
	EDTA	0.150		Methylparaben	<1.0
Rose water	0.008	FD&C Yellow No. 5	<1.0		
Thimerosal	0.003	D&C Yellow No. 10	<1.0		
HZI-Skin Cleanser	Water	44.0	HZW-Liquid Soap No. 2	Water and volatiles	60-80
	Sodium laureth sulfate (30%)	50.0		TEA-lauryl sulfate	1-10
	Cocamide MEA	5.0		Sodium laureth sulfate	1-10
	Sodium chloride	0.4		Sodium lauroyl sarcosinate	1-10
	Disodium EDTA	0.2		Lauramide DEA	1-10
	Imidazolidinyl urea	0.2		Glycol distearate	1-10
	Methylparaben	0.2		Isostearamideopropyl morpholine lactate	0.1-1.0
	Benzoic acid	0.1		Disodium ricinoleamide MEA-sulfosuccinate	0.1-1.0
				DMDM hydantoin	0.1-1.0
		Citric acid	0.1-1.0		
		Tetrasodium EDTA	<0.1		
HZJ-Mild Shampoo	Water	52.09	HZX-Shampoo No. 2	Water	69.1895
	Tween 20	12.63		Ammonium lauryl sulfate (25%)	25.0000
	Cocamphodiacetate (24%)	21.25		Cocamide DEA	3.0000
	PEG 6000	2.60		Hydroxypropyl methylcellulose	1.4500
	Cedepal TD403 (75%)	6.53		EDTA	0.6000
	Hydrochloric acid (15%)	1.68		Formaldehyde	0.2000
	Arlacel 20	0.92		Benzyl alcohol	0.2000
	Benzyl alcohol	0.10		Benzophenone-4 sodium hydroxide	0.0400
	Dowicel 200	0.10		Citric acid	0.0100
D&C Yellow No. 10 (0.2%)	1.70	Ammonium chloride	0.0100		
D&C Orange No. 4 (0.2%)	0.20	FD&C Blue No. 1	0.0005		
HZK-Bubble Bath	Water	68.75	HZY-Anti-Dandruff Shampoo	Water	27.13
	Sodium laureth sulfate (60%)	25.00		Sodium lauroyl sarcosinate (30%)	15.00
	Lauramide DEA	4.50		Lauramide DEA	4.50
	SD Alcohol 3-A	3.75		TEA-lauryl sulfate (40%)	45.00
	Sodium chloride	0.80		Glycol distearate	3.00
	Triethanolamine	0.40		Zinc pyrithione	2.10
	Phosphoric acid (86.5%)	0.35		Sodium chloride	1.20
	Sorbic acid	0.20		Citric acid	0.90
				Imidazolidinyl urea	0.50
		Methylparaben	0.30		
		Propylparaben	0.10		
		Xanthan gum	0.27		
HZL-Foam Bath	Water	47.760	HZZ-Facial Cleanser	Water	32.55
	Sodium laureth sulfate (26%)	46.000		Mineral oil	40.00
	Cocamido propyl betaine (30%)	2.500		Beeswax	2.30
	Sodium chloride	2.400		PEG-16 soya sterol	5.00
	Glycol monostearate	0.400		PEG-8 dilaurate	2.00
	Color solution	0.300		Cetaryl alcohol (70%)	0.80
	DMDM hydantoin (54%)	0.250		Ceteareth 20 (30%)	0.80
	Methylparaben	0.200		Beheme acid	0.80
	Propylparaben	0.100		Sodium borate	0.75
	BHT	0.050		Ceresin	0.50
	Aloe vera gel	0.015		Carbopol dispersion (25%)	15.00
	Citric acid	0.016		Methylparaben	0.15
	Tetrasodium EDTA	0.010		Propylparaben	0.10
		Disodium EDTA	0.05		
HZM-Shampoo No. 3	Water	80-90			
	Ammonium lauryl sulfate	5-10			
	Lauramide DEA	1-5			
	Cocamidopropyl sulfate	1-5			
	Citric acid	<1.0			
	Ammonium chloride	<1.0			
	DMDM Hydantoin	<1.0			
	Tetrasodium EDTA	<1.0			
	Methylparaben	<1.0			
	FD&C Yellow No. 5	<0.1			
	D&C Yellow No. 10	<0.1			
	FD&C Red No. 4	<0.1			
	PPG-9				

Appendix B3

Components of Formulations Tested in Swanson et al. (1995)

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Components of Formulations Tested in Swanson et al. (1995)

Code	Formulation	Formulation Components	Percentage	pH
1	Toilet Bowl Cleaner	Water	90-95	8.8
		Nonionic Surfactant	1-5	
		Anionic Surfactant	1-5	
		Preservative	< 1	
		Thickener	< 1	
		Dye	< 1	
		Fragrance	< 1	
		Phosphate	< 1	
2	Floor Cleaner	Water	90-95	10.8
		Anionic Surfactant	1-5	
		Nonionic Surfactant	1-5	
		MEA	< 1	
		Fragrance	< 1	
		Dye	< 1	
3	Meat Room Degreaser	Water	80-85	12.65
		Anionic surfactant	1-5	
		Nonionic surfactant	1-5	
		Chelator	1-5	
		Glycol ether	1-5	
		Inorganic salt	1-5	
		KOH	< 1	
4	Toilet Bowl Cleaner	Water	90-95	2.5
		Organic acid	1-5	
		Anionic surfactant	1-5	
		Thickener	< 1	
		Dye	< 1	
		Fragrance	< 1	
5	All Purpose Cleaner	Water	90-95	13
		Nonionic surfactant	1-5	
		Inorganic salt	1-5	
		NaOH	1-5	
		Chelator	< 1	
		KOH	< 1	
		Anionic surfactant	< 1	
		Fragrance	< 1	
		Dye	< 1	
6	Bathroom Cleaner	Water	80-85	13
		Chelator	10-15	
		Glycol ether	1-5	
		Nonionic surfactant	1-5	
		Quaternary compound	< 1	

Components of Formulations Tested in Swanson et al. (1995)

Code	Formulation	Formulation Components	Percentage	pH
7	All Purpose Cleaner	Water	80-85	14
		Inorganic salt	5-10	
		NaOH	1-5	
		Nonionic surfactant	1-5	
		Anionic surfactant	1-5	
		KOH	< 1	
		Chelator	< 1	
		Amphoteric surfactant	< 1	
		Fragrance	< 1	
		Dye	< 1	
8	Pot and pan cleaner	Water	60-65	7.8
		Anionic surfactant	25-30	
		Nonionic surfactant	5-10	
		Glycol ether	1-5	
		Preservative	< 1	
		Dye	< 1	
9	Heavy-duty cleaner/degreaser	Water	75-80	13.6
		Inorganic salts	10-15	
		Chelator	1-5	
		NaOH	1-5	
		Nonionic surfactant	1-5	
		Amphoteric surfactant	1-5	
		Dye	< 1	
10	Floor cleaner	Water	85-90	11.7
		MEA	1-5	
		Anionic surfactant	1-5	
		Glycol ether	1-5	
		Ammonium hydroxide	1-5	
		Nonionic surfactant	< 1	
		Chelator	< 1	
		Fragrance	< 1	
		Dye	< 1	
11	General Cleaner	Water	70-75	1
		Inorganic acid	15-20	
		Nonionic surfactant	1-5	
		Amphoteric surfactant	< 1	
		Fragrance	< 1	
		Dye	< 1	

Components of Formulations Tested in Swanson et al. (1995)

Code	Formulation	Formulation Components	Percentage	pH
12	General Cleaner	Water	75-80	14
		Anionic surfactant	10-15	
		Nonionic surfactant	5-10	
		Chelator	1-5	
		Inorganic salt	1-5	
13	Cleaner/Degreaser	Water	65-70	12
		Glycol ether	10-15	
		Anionic surfactant	1-5	
		Inorganic salt	1-5	
		Chelator	1-5	
		Nonionic surfactant	5-10	
		NaOH	1-5	
Dye	< 1			
14	Floor stripper	Water	50-55	11.5
		Glycol ether	30-35	
		MEA	10-15	
		Organic solvent	1-5	
		Ammonium hydroxide	1-5	
		Anionic surfactant	1-5	
15	Heavy Duty cleaner	Water	65-70	13.5
		Inorganic salts	10-15	
		Anionic surfactant	5-10	
		Chelator	1-5	
		NaOH	1-5	
		Nonionic surfactant	1-5	
		Amphoteric surfactant	1-5	
16	Degreaser	Water	65-70	12.9
		Anionic surfactant	5-10	
		Chelator	5-10	
		Nonionic surfactant	5-10	
		KOH	1-5	
		Inorganic salt	1-5	
		Glycol ether	1-5	

Components of Formulations Tested in Swanson et al. (1995)

Code	Formulation	Formulation Components	Percentage	pH
17	Floor stripper	Water	60-65	13.1
		Glycol ether	10-15	
		Anionic surfactant	10-15	
		MEA	5-10	
		Organic solvent	1-5	
		Inorganic salt	1-5	
		NaOH	1-5	
		Chelator	< 1	
		Flurochemical	< 1	
		Fragrance	< 1	
18	Floor stripper	Water	55-60	14
		Glycol ether	10-15	
		Inorganic salt	5-10	
		Amphoteric surfactant	5-10	
		MEA	1-5	
		NaOH	1-5	
		Chelator	1-5	
		Nonionic surfactants	< 1	
		Fragrance	< 1	
19	Glass cleaner	Water	65-70	12.1
		Glycol ether	20-25	
		Ammonium hydroxide	1-5	
		Anionic surfactant	1-5	
		Chelator	1-5	
		Dye	< 1	
20	Metal cleaner	Water	65-70	14
		Chelator	5-10	
		NaOH	5-10	
		Nonionic surfactant	5-10	
		KOH	< 1	

Appendix B4

Components of Formulations Tested in Swanson and Harbell (2000)

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Components of Formulations Tested in Swanson and Harbell (2000)

Substance	Group	Formulation Component	Percentage
1	1-1	Cyclomethicone	50-55
		Alcohol	40-45
		Active	10-15
2	1-2	Dimethicone (alkoxylated derivative)	50-55
		Alcohol	40-45
		Active	10-15
3	1-3	Alcohol	40-45
		Cyclomethicone	30-35
		Dimethicone (alkoxylated derivative)	20-25
		Active	10-15
4	2-4	Isoparaffinic hydrocarbon	80-85
		Active	10-15
		Cyclic polysiloxane	5-10
		Emollient	< 1
5	2-5	Isoparaffinic hydrocarbon	80-85
		Active	10-15
		Cyclic polysiloxane	5-10
		Alcohol	1-5
		Emollient	< 1
6	2-6	Isoparaffinic hydrocarbon	75-80
		Active	10-15
		Cyclic polysiloxane	5-10
		Alcohol	5-10
		Emollient	< 1
7	2-7	Isoparaffinic hydrocarbon	70-75
		Active	10-15
		Alcohol	10-15
		Cyclic polysiloxane	5-10
		Emollient	< 1
8	2-8	Isoparaffinic hydrocarbon	65-70
		Alcohol	15-20
		Active	10-15
		Cyclic polysiloxane	5-10
		Emollient	< 1
9	3-9	Alcohol	60-65
		Water	25-30
		Active	10-15
		Fragrance	< 1

Components of Formulations Tested in Swanson and Harbell (2000)

Substance	Group	Formulation Component	Percentage
10	3-10	Water	45-50
		Alcohol	40-45
		Active	10-15
		Fragrance	< 1
11	3-11	Water	55-60
		Alcohol	30-35
		Active	10-15
		Fragrance	< 1
12, 13	Benchmark	Alcohol	85-90
		Active	10-15
		Dimethicone	1-5
		Fragrance	< 1
14, 15	Ethanol	Ethanol	100
16	Vehicle control	Alcohol	85-90
		Water	10-15
		Dimethicone	1-5
		Fragrance	< 1