201-16590D

I U C L I D

D a t a S e t

Existing Chemical	Substance ID: Fatty acids, coco, 2-sulfoethyl esters, sodium salts (Sodium Cocoyl Isethionate)
Producer Related Part	
Company:	Keller and Heckman LLP
Creation date:	24-NOV-2006
Substance Related Part	
Company:	Keller and Heckman LLP
Creation date:	24-NOV-2006
Printing date:	24-NOV-2006
Revision date:	
Date of last Update:	24-NOV-2006
Number of Pages:	**60**
Chapter (profile):	Chapter: 1, 2, 3, 4, 5, 7
Reliability (profile):	Reliability: without reliability, 1, 2, 3, 4
Flags (profile):	Flags: without flag, confidential, non confidential, WGK (DE), TA-Luft (DE), Material Safety Dataset, Risk Assessment, Directive 67/548/EEC

1.0.1 OECD and Company Information

Name: The Sodium Ethyl Sulfonates Coalition (SESC)

Remark: The Coalition consists of:

BASF Corporation
Clariant Corporation
Huntsman Petroleum Corporation
Unilever Home and Personal Care

1.0.2 Location of Production Site

Remark: Not an HPV Challenge endpoint.

1.0.3 Identity of Recipients

Remark: Not an HPV Challenge endpoint.

1.1 General Substance Information

Substance type: organic
Physical status: solid
Test substance: Fatty acids, coco, 2-sulfoethyl esters, sodium salts (Sodium Cocoyl Isethionate;CAS# 61789-32-0; EINECS# 263-052-3)

1.1.1 Spectra

(a)
Type: Ultraviolet absorbance spectrum
Method: DEFI test solutions were prepared in HPLC grade water at a single concentration for each of two separate samples. The resultant concentration for the Hammond sample was 553.3 mg/L, representing approximately 415 mg DEFI and 138.3 mg free fatty acids. The concentration of the Mazer sample was 533.3 mg/L, representing approximately 320 mg DEFI, 181.3 mg free fatty acids, and 21 mg sodium isethionate. A Perkin Elmer Lambda 4B UV/VIS spectrophotometer was used and the absorbance spectrum from each test solution scanned from 500 to 201 nm as recommended by CIR guidelines.
Year: 1990 **GLP:** no
Test substance: DEFI: Two samples - Hammond (Lot 90-7623; 75% DEFI/25% free fatty acid sodium salts; mean MW = 342; white waxy chips), and Mazer (Lot 92644; 60% DEFI/34% free fatty acid sodium salts/4% sodium isethionate/1% water; mean MW = 337; coarse waxy powder).
Result: Both samples exhibited a broad, low-intensity absorbance at about 204 nm with molar extinction coefficients of about 286 and 363 for the Hammond and Mazer samples, respectively. The peak tailed off to 500 nm with nearly inappreciable extinction coefficients of about 39 and 11 at 320 and 400 nm, respectively for the Hammond sample, and about 75 and 25, respectively for the Mazer sample.

Source: Brown, M. 1990. Ultraviolet spectrophotometric pre-screening of sodium cocoyl isethionate (DEFI) for dermal photosensitization. Unilever internal report, Project No. 688191, Report No. SAS 90 0438.
Reliability: (2) valid with restrictions. Does not appear to be GLP, but otherwise appears to be a well-conducted study.

(b)
Type: Ultraviolet absorbance spectrum
Method: SCI was dissolved in HPLC grade methanol at 1,002 mg/L, nearly its limit of solubility. The spectrum was obtained on a Perkin Elmer Lambda 4B UV/VIS spectrophotometer using matched 10-mm quartz cells for the sample and the methanol reference. The spectrum was scanned from 210 to 500 nm as recommended by CIR guidelines.
Year: 1990 **GLP:** no
Test substance: A sample of commonly available sodium cocoyl isethionate (SCI).
Result: There was essentially no UV absorption above about 285 nm. At 320 nm, the lower boundary of the UVA region generally associated with photosensitization, the measured absorbance was 0.005, from which a molar extinction coefficient <1 was calculated.
Remark: The lack of significant absorbance in either the UVA or UVB region demonstrates that SCI is unlikely to exhibit any dermal photosensitizing behavior.
Source: Brown, M. 1990. Ultraviolet absorbance spectrum of sodium cocoyl isethionate. Unilever internal report, Report No. SAS 90 0488.
Reliability: (2) valid with restrictions. Does not appear to be GLP, but otherwise appears to be a well-conducted study.

1.2 Synonyms

Coconut Fatty Acid, 2-Sulfoethyl Esters, Sodium Salt
Fatty Acids, Coconut Oil, Sulfophenyl Esters, Sodium Salt
Fatty Acids, Coco, 2-Sulfophenyl Esters, Sodium Salt
Igepon AC-78
Jordapon CI
DEFI (Directly Esterified Fatty Isethionate)

1.3 Impurities

Impurity	Concentration
Arsenic	3 ppm maximum
Iron	25 ppm maximum
Lead	20 ppm maximum
Sodium chloride	0.8% maximum
Free fatty matter	10% maximum
Sodium isethionate	5%
Free fatty acid	18%
Sodium soap	3%

Source: Zondlo, M.M. 1993. Final report on the safety assessment of sodium cocoyl isethionate. Journal American College of Toxicology. 12:459-479.

1.4 Additives

Remark: None identified

1.5 Quantity

Quantity: All of the uses for SCI are regulated under FDA and are not TSCA-reportable.

1.6.1 Labelling

Remark: No special labeling required

1.6.2 Classification

Remark: No special classification

1.7 Use Pattern

Remark: Primarily as a surfactant/cleansing agent in skin and face cleansing products such as non-soap cleansing bars, synthetic detergent bars, body cleansers, and shampoos. SCI is also used in dressings and other hair grooming aids.

1.7.1 Technology Production/Use

Remark: Not an HPV Challenge endpoint.

1.8 Occupational Exposure Limit Values

Remark: No TLV has been established

1.9 Source of Exposure

Remark: Primarily dermal exposure from use of syndet bars and other cleansers.

1.10.1 Recommendations/Precautionary Measures

Remark: See sodium cocoyl isethionate assessment plan.

1.10.2 Emergency Measures

Remark: See sodium cocoyl isethionate assessment plan.

1.11 Packaging

Remark: Includes small and large packaging, bulk transport

1.12 Possib. of Rendering Subst. Harmless

Remark: Not applicable

1.13 Statements Concerning Waste

Remark: See sodium cocoyl isethionate assessment plan.

1.14.1 Water Pollution

Remark: Not a significant water pollutant.

1.14.2 Major Accident Hazards

Remark: None

1.14.3 Air Pollution

Remark: Not a significant air pollutant.

1.15 Additional Remarks

Remark: See sodium cocoyl isethionate assessment plan for more information

1.16 Last Literature Search

Date of Search: 31-JAN-2006

1.17 Reviews

Remark: None

1.18 Listings e.g. Chemical Inventories

Remark: TSCA inventory (USA)
Domestic Substances List (DSL) - Canada
EINECS (Europe)

2.1 Melting Point

Value: 293.07°C
GLP: No
Remark: Calculated using the Mean or Weighted MP method in MPBPWIN v1.41
Test substance: Sodium cocoyl isethionate; Molecular weight 386.53
Source: EPI Suite v3.12.
Reliability: (2) Valid with restrictions. Standard EPA Estimation software.

2.2 Boiling Point

Value: 672.26°C
GLP: No
Remark: Calculated using the Adapted Stein & Brown method in MPBPWIN v1.41
Test substance: Sodium cocoyl isethionate; Molecular weight 386.53
Source: EPI Suite v3.12.
Reliability: (2) Valid with restrictions. Standard EPA Estimation software.

2.3 Density

Remark: Not an HPV Challenge endpoint.

2.3.1 Granulometry

Remark: Not an HPV Challenge endpoint.

2.4 Vapor Pressure

Value: 9.58×10^{-16} mm Hg at 25°C
GLP: No
Remark: Calculated using the Modified Grain method in MPBPWIN v1.41
Test substance: Sodium cocoyl isethionate; Molecular weight 386.53
Source: EPI Suite v3.12.
Reliability: (2) Valid with restrictions. Standard EPA Estimation software.

2.5 Partition Coefficient

Value: 2.38
GLP: No
Remark: Calculated using KOWWIN v1.67.
Test substance: Sodium cocoyl isethionate; Molecular weight 386.53
Source: EPI Suite v3.12.
Reliability: (2) Valid with restrictions. Standard EPA Estimation software.

2.6.1 Water Solubility

Value: 0.01% (100 ppm)
GLP: No
Remark: Reported at 25°C in study focusing on the understanding of the solubulization of SCI in water.
Test substance: Sodium cocoyl isethionate

Source: Sun, J.Z., Parr, J.W., and Erickson, M.C.E. 2003. Solubilization of sodium cocoyl isethionate. J. Cosmet. Sci. 54:559-568.
Reliability: (2) Valid with restrictions. Peer reviewed journal well documented for discussion of enthalpy of solubilization and equilibrium of solubilization. Reports SCI solubilization in water as 0.01% by weight.

2.6.2 Surface Tension

Remark: Not an HPV Challenge endpoint.

2.7 Flash Point

Value: >93°C
Source: BASF Corporation Material Safety Data Sheet for Jordapon CI Powder, Version 1.0, Revision date 2005/02/02.

2.8 Auto Flammability

Value:
Remark: Not flammable.

2.9 Flammability

Result:
Remark: Not flammable.

2.10 Explosive Properties

Result:
Remark: Not explosive.

2.11 Oxidizing Properties

Remark: Not an oxidizer.

2.12 Additional Remarks

Memo: None

3.1.1 Photodegradation

Type: atmospheric oxidation
INDIRECT PHOTOLYSIS
Sensitizer: OH
Conc. of sens.: 1.5 x 10^{6} molecule/cm^{3}
Rate constant: 21.6157 x 10^{-12} cm^{3}/(molecule * sec)
Degradation: = 50 % after 5.938 hours
Method: Calculated: Hydroxy Radical Reaction using AOPWIN, V1.91 at 25°C
Year: 2006 **GLP:** no
Test substance: Sodium cocoyl isethionate; molecular weight 386.53
Remark: SCI does not exhibit phototoxicity (see section 5.2.1(b)).
Source: EPI Suite v3.12
Reliability: (2) valid with restrictions. Standard EPA Estimation software.

3.1.2 Stability in Water

Remark: No data available.

3.1.3 Stability in Soil

Remark: Not an HPV Challenge endpoint.

3.2 Monitoring Data (Environment)

Remark: No data available.

3.3.1 Transport between Environmental Compartments

Remark: Not an HPV Challenge endpoint.

3.3.2 Distribution

Method: Calculation using Fugacity Level III in EPI Suite
Remark: Mass Distribution by Environmental Compartment
Air: 0.632%
Water: 24.3%
Soil: 74.9%
Sediment: 0.141%
GLP: No
Test substance: Sodium cocoyl isethionate; Molecular weight 386.53
Source: EPI Suite v3.12.
Reliability: (2) Valid with restrictions. Standard EPA Estimation software.

3.4 Mode of Degradation in Actual Use

Memo: Biological degradation.

3.5 Biodegradation

(a)

Type: aerobic
Inoculum: activated sludge
Concentration: 10 mg/L and 20 mg/l
Contact time: 28 day
Degradation: = 78.6 % after 28 days (20 mg/L)
= 77.8% after 28 days (10 mg/L)
Method: Modified Sturm Test according to SOP 05001 and interpreted according to OECD Guideline 301B. A series of eight 5-L amber glass bottles, each containing 3 liters of mineral salts nutrient medium inoculated with sewage microorganisms, was purged with carbon dioxide-free air for 24 hours. At the end of this period test substance or control substance solution was added to all but test vessels 1 and 2, which were used as blank controls. DEFI Base was tested at concentrations of 10 and 20 mg/L. The test vessels were continuously purged with carbon dioxide-free air for 28 days at 20 ± 2°C. The amount of carbon dioxide produced from each test vessel was determined by back titration of the barium hydroxide solution in Dreschel bottles attached to each bottle. A test substance is considered to have passed the test if 60% of the theoretical carbon dioxide production is achieved within 10 days of reaching 10% ultimate biodegradation.
Year Conducted: 1983 **GLP:** yes
Test substance: DEFI Base (Sample BIOC/82/17), consisting mainly of sodium acyl coconut isethionate (66% by weight) with lower levels of free stearic/palmitic acids (55/45)(16%), coconut fatty acids (4%), sodium isethionate (7%) and water (2%).
Result: DEFI Base is readily biodegradable. As shown in the table below, the test substance passed the criterion of achieving at least 60% of the theoretical biodegradation within 10 days of reaching 10% degradation.

Test substance	Percent Biodegradation						
	Day 3	Day 6	Day 12	Day 15	Day 20	Day 26	Day 28
Sodium acetate (positive control)	19.2	43.7	69.8	79.5	79.5	80.2	81.5
DEFI Base (10 mg/L)	16.0	44.3	63.9	73.3	73.8	76.1	77.8
DEFI Base (20 mg/L)	15.8	41.9	62.9	72.9	74.2	77.4	78.6

Remarks: The amount of carbon dioxide produced by the two control test vessels was 5.34 and 6.23 mg, respectively. The extent of sodium acetate degradation demonstrates that the inoculum used in the test was viable and the test is valid. The temperature range was 16.0-24.0°C during the test, which exceeded the protocol range. The pH range of the test media after addition of the test substance stock solutions was 7.44-5.60.
Source: Watson, G.K. 1983. Modified Sturm Test on DEFI Base (Sodium Acyl Ethoxy Sulphonate). Unilever Research, Port Sunlight Laboratory, Report No. BD//RS43/01.
Reliability: (2) valid with restrictions due to some study deviations

(b)

Type: aerobic
Inoculum: secondary effluent
Concentration: 5 mg/l related to test substance
Contact time: 14 days
Degradation: = 99.6 % after 14 days
Method: Modified OECD Screening Test according to SOP 05201. The test is designed to determine the primary biodegradation of a test substance. It is a static test consisting of an inorganic salts medium containing facultative microorganisms and test substance. This solution is incubated for 19 days at 20°C during which time it is aerated by swirling on an orbital shaker and the disappeaance of test compound. Loss of the DEFI Base was determined using the MBAS method. Secondary effluent is used as the inoculm and DEFI Base is tested at a concentration of 5 mg/L. Marlon A and Oronite 60 were used as positive and negative reference materials for comparison.
Year Conducted: 1983 **GLP:** yes
Test substance: DEFI Base (Sample BIOC/82/17), consisting mainly of sodium acyl coconut isethionate (66% by weight) with lower levels of free stearic/palmitic acids (55/45)(16%), coconut fatty acids (4%), sodium isethionate (7%) and water (2%).
Results: DEFI Base undergoes rapid primary biodegration. A biodegration level of 99.2% was achieved by day 2 of the study and 99.7% by day 5. The study was stopped at day 14 with a measured biodegration of 99.6%.
Remarks: Results of the accompanying Marlon A and Oronite 60 tests were 95.2% and 7.8% at 14 days, confirming that the test was valid and DEFI Base is rapidly biodegraded.
Source: Birch, R.R. 1983. The Primary Biodegradation of DEFI Base C_{12}-C_{14} Acyl Ethoxy Sulphonate. Unilever Research, Port Sunlight Laboratory, Report No. BD/RS43/02.
Reliability: (2) valid with restrictions due to incomplete reporting

(c)

Type: aerobic
Inoculum: activated sludge
Concentration: 30 mg/L
Contact time: 28 day
Degradation: = 94.1 % after 28 days
Method: Aerobic ready biodegradability test according to OECD Guideline Screening Test 301E and DIN ISO 7827. Biodegradation was measured as a function of DOC elimination. The test solution was 30 mg/L at a pH of 7.2. The solution was clear during the study. Activated sludge was collected from the sewage system at Niederrad. Approximately 10^6 colony forming units per liter were incubated at 20 ± 2°C and pretreated for one day without nutrient solution. Sodium benzoate was used as a reference substance. One liter glass round vessels were used and covered with aluminum foil and placed in the dark in a mechanical shaker.
Year Conducted: 1994 **GLP:** not reported
Test substance: Hostapon SCI, consisting mainly of sodium coconut isethionate (85-89% by weight) with lower levels of coco fatty acids (≤2.5%), sodium isethionate (10.5%) and sodium sulfate (≤1%).
Result: Hostapon SCI is readily biodegradable. As shown in the table below, the test substance achieved >90% biodegradation in less than 7 days

Day	Reference Substance		Test Substance	
	DOC* (mg/L)	Percent Degradation	DOC* (mg/L)	Percent Degradation
0	20.3	-	13.85	-
7	2.0	91.5	1.15	93.7
14	1.2	95.5	1.1	94.1
21	0.8	97.5	1.6	90.4
28	0.8	97.5	1.1	94.1

* DOC of blank = 0.3 mg/L

Remarks: Hostapon SCI is readily biodegradable.
Source: Bucking, H.W. and Pleschke, D. 1994. Hostapon SCI: Report on the biodegradability in accordance with OECD Screening Test 301E and DIN ISO 7827. Hoechst Aktiengesellschaft, Report No. A 506-1. (in German)
Reliability: (2) valid with restrictions.

(d)
Type: aerobic
Inoculum: activated sludge
Concentration: 20 mg/L
Contact time: 28 day
Degradation: = 93.5 % after 28 days
Method: Aerobic ready biodegradability test according to OECD Guideline Screening Test 301E and DIN ISO 7827. Biodegradation was measured as a function of DOC elimination. The test solution was 20 mg/L at a pH of 7.2. The solution was clear during the study. Activated sludge was collected from the sewage system at Niederrad. Approximately 10^6 colony forming units per liter were incubated at 20 ± 2°C and pretreated for one day without nutrient solution. Sodium benzoate was used as a reference substance. One liter glass round vessels were used and covered with aluminum foil and placed in the dark in a mechanical shaker.
Year Conducted: 1994 **GLP:** not reported
Test substance: Hostapon SCID (Batch 1, July 1993, Turin), consisting mainly of sodium coconut isethionate (66% by weight) with lower levels of stearic acid (19 ± 2%), coco fatty acids (7 ± 2%) and sodium isethionate (max 4%).
Result: Hostapon SCI is readily biodegradable. As shown in the table below, the test substance achieved >90% biodegradation in less than 7 days.

Day	Reference Substance		Test Substance	
	DOC* (mg/L)	Percent Degradation	DOC* (mg/L)	Percent Degradation
0	20.3	-	12.7	-
7	2.0	91.5	2.0	91.1
14	1.2	95.5	1.8	89.5
21	0.8	97.5	1.4	93.5
28	0.8	97.5	1.1	93.5

* DOC of blank = 0.3 mg/L

Remarks: Hostapon SCI is readily biodegradable.
Source: Bucking, H.W. and Pleschke, D. 1994. Hostapon SCID: Report on the biodegradability in accordance with OECD Screening Test 301E and DIN ISO 7827. Hoechst Aktiengesellschaft, Report No. A 506-2. (in German)

Reliability: (2) valid with restrictions.

3.6 BOD5, COD or BOD5/COD Ratio

Remark: No data available.

3.7 Bioaccumulation

BCF: 70.79 (log BCF = 1.850)
Method: Calculation using BCFWIN v2.15 based on estimated log Kow = 4.53
Year: 2006 **GLP:** no
Test substance: Sodium cocoyl isethionate, molecular weight = 386.53
Remark: A BCF of 70.79 indicates a low affinity for uptake.
Source: EPI Suite v3.12.
Reliability: (2) valid with restrictions. Standard EPA Estimation software.

3.8 Additional Remarks

Remarks: None

AQUATIC ORGANISMS

4.1 Acute/Prolonged Toxicity to Fish

(a)

Type: Semi-static
Species: *Oncorhynchus mykiss* (Rainbow trout, fresh water) (reported as *Salmo gairdneri* in study report)
Endpoint: Mortality
Exposure period: 96 hours
Unit: mg/L **Analytical monitoring:** yes
LC_{50}: >25
Method: Juvenile rainbow trout (approximately 4-½ months old) were exposed to six test concentrations (3.2, 5.6, 10, 18, 32, and 100 mg/L) and a control for 96 hours. Replicate chambers (1000 mL) were used for each concentration, with 10 fish per chamber (20 per concentration). At 48 hours the test solutions were replaced with freshly prepared solutions by transferring the fish to new tanks containing the new solutions. Mortalities were recorded at 24 hour intervals and dead fish removed. Stock solution was prepared at 1000 mg/L and 0.08 diluted as appropriate to make the desired nominal concentrations. Concentrations of selected test solutions (0, 3.2, 10, 100 mg/L) were analyzed at 0, 48 and 96 hours using the methylene blue (MBAS) method. Temperature, pH, dissolved oxygen and toal hardness were also measured in the test solutions.
Year Conducted: 1984 **GLP:** yes
Test substance: DEFI Base (Sample BIOC/82/17), consisting mainly of sodium acyl coconut isethionate (66% by weight) with lower levels of free fatty acid (21%), sodium isethionate (7%) and water (<2%).
Results: No mortality was observed in any test chamber, except in one of the two chambers at the 100 mg/L nominal concentration where two fish died (10% mortality for the concentration). Therefore, the LC_{50} is greater than the highest concentration tested of 100 mg/L nominal (>25 mg/L measured). Cumulative mortality is shown in the following table:

Nominal Concentrations (mg/L)	Percent Mortality
	96 hours
Control	0
3.2	0
5.6	0
10	0
18	0
32	0
100	10

Remark: The water quality was maintained during the study as: temperature, 12.2 ± 0.6 °C (11.0-13.0°C); pH, 8.0 ± 0.2 (7.3-8.1); dissolved oxygen, 9.2 ± 0.8 mg/L (6.5-9.7 mg/L); and total hardness, 118 ± 8 as $CaCO_3$ (102-128 mg/L). Analysis of test solutions indicate that the desired conditions were achieved initially but there was some loss of test substance in the 48 hours following renewal of the solutions. The table shows results of the chemical analyses:

Nominal Concentrations (mg/L)	Measured Concentrations (mg/L)			
	0 hours	48 hours (old)*	48 hours (new)*	96 hours
0 (control)	0.05	0.09	0.06	0.08
3.2	2.7	0.15	3.0	0.11
10	8.7	0.38	9.1	0.27
100	90.6	62.9	95.7	25.2

* Solutions before (old) and after (new) renewal

Source: Marshall, S.J. 1984. The acute toxicity of DEFI to rainbow trout. Unilever Research, Port Sunlight Laboratory, Report No. AT/RS43/01.
Reliability: (2) valid with restrictions

(b)
Type: Static
Species: *Brachydanio rerio* (Zebra fish, fresh water)
Endpoint: Mortality
Exposure period: 96 hours
Unit: mg/L **Analytical monitoring:** no
LC_{50}: 33
Method: The study was conducted in accordance with Guideline 79/831/EWG, Method C.1. Acute Toxicity for Fish, and OECD Guideline 203. Juvenile zebra fish (average length 2.9 cm) were exposed to three test concentrations(10, 22 and 50 m/L) and a control for 96 hours.
Year Conducted: 1994 **GLP:** yes
Test substance: Hostapon SCID (Batch 1, July 1993, Turin), consisting mainly of sodium coconut isethionate (66% by weight) with lower levels of stearic acid (19 ± 2%), coco fatty acids (7 ± 2%) and sodium isethionate (max 4%).
Results: The results of the 96 hour exposure are shown in the following table:

Toxicity concentrations (mg/L)

	24 hours	48 hours	72 hours	96 hours
LC_0	22	22	22	22
LC_{50}	22-50	33	33	33
LC_{100}	Not determined	50	50	50

Remark: The water quality was maintained during the study as: temperature, 21.9-22.8°C; pH, 7.7-8.5; dissolved oxygen, 5.9-9.3 mg/L).
Source: Zok, Dr., and Jung, Dr. 1994. Hostapon SCID: Examination of the acute toxicity to Zebra fish (*Brachydanio rerio*) over 96 hours. Hoechst Pharma Development Toxicology Center. Report No. 94.0044. (in German)
Reliability: (2) valid with restrictions. Some details missing from report.

4.2 Acute Toxicity to Aquatic Invertebrates

(a)
Type: Semi-static
Species: *Daphnia magna* (Crustacea)
Endpoint: immobility
Exposure period: 48 hours
Unit: mg/L **Analytical monitoring:** no
EC_{50}: >32
Method: Less than 24 hour old *D. magna* at test initiation were exposed to

six concentrations of sodium cocoyl isethionate (nominal 0, 3.2, 5.6, 10, 18 and 32 mg/L). The media was renewed after 24 hours. Five daphnids were distributed to each of the four replicate 120 mL test vessels (total 20 per concentration) and held at 19.3°C (SD = 0.3°C) under normal laboratory light intensity with a photoperiod of 16 hours light and 8 hours dark. Daphnids were checked at 24 and 48 hours for immobility. A stock solution of 500 mg/L was prepared and diluted as appropriate to obtain the desired nominal test concentrations. ***Daphnia*** were not fed during the test. No analysis of the test solutions was conducted. Temperature, pH, dissolved oxygen and total hardness of the test solutions was also measured.

Year Conducted: 2003 **GLP:** yes

Test substance: Sodium cocoyl isethionate (Sample No. S2470701)

Results: No immobilizaton was observed at any of the test concentrations and all animals appeared healthy throughout the study. The 48-hour EC_{50} is greater than 32 mg/L, the highest nominal concentration tested. In a preliminary rangefinder test carried out with concentrations of 0, 0.1, 1.0, 10 and 100 mg/L, high levels of precipitation at 100 mg/L were observed becoming attached to the ***Daphnia***, thereby causing indirect physical immobilization. The highest concentration for the definitive study was thus selected as 32 mg/L to take this into consideration.

Remarks: Water quality parameters were: mean temperature 19.3°C (range 18.5-20.5°C), mean pH 8.1 (7.7-8.8), mean dissolved oxygen 7.0 mg/L (6.4-7.4 mg/L), and mean total hardness as $CaCO_3$ 235 (225-244). There was a small amount of precipation observed in the test solutions at 18 and 32 mg/L. This precipation did not appear to interfere with the ***Daphnia*** and there were no obvious differences in water quality.

Source: Jardine, L. and Roberts, J. 2005. Acute toxicity of sodium cocoyl isethionate to ***Daphnia magna***. Unilever Colworth, Safety and Environmental Assurance Centre, Study No. EAD 030078.

Reliability: (2) valid with restrictions (test concentrations not measured)

(b)

Type: Static

Species: ***Daphnia magna*** (Crustacea)

Endpoint: immobility

Exposure period: 48 hours

Unit: mg/L **Analytical monitoring:** yes

EC_{50}: >73 (as isethionate)

Method: Less than 24 hour old ***D. magna*** at test initiation were exposed to seven concentrations of DEFI Base (nominal 1, 5.6, 10, 18, 32, 56 and 100 mg/L as isethionate) in static tests. Groups of ten daphnids were distributed to each of four 100 mL test vessels per concentration (total 40 per concentration) and held at 20 ± 2°C and 500 lux candelas under a 16 hour light, 8 hour dark photoperiod for 48 hours. Daphnids were checked at 24 and 48 hours for immobility. A stock solution of 1000 mg/L was prepared and diluted as appropriate to make the desired nominal test concentrations. Stock and test solutions were analyzed at the start and finish of the study using the small scale methylene blue (MBAS) method. Temperature, pH, dissolved oxygen and total hardness of the test solutions was also measured.

Year Conducted: 1984 **GLP:** yes

Test substance: DEFI Base (Sample BIOC/82/17), consisting mainly of sodium acyl coconut isethionate (66% by weight) with lower levels of free fatty acid (21%), sodium isethionate (7%) and water (2%).

Results: Cumulative percentage immobile at 24 and 48 hours is shown below:

Nominal Concentrations (mg/L)	Percent Immobile	
	24 hour	48 hour
Control	0	0
1	0	0
5.6	0	7.5
10	0	7.5
18	0	7.5
32	0	2.5
56	0	0
100	0	12.5

Remarks: No dose-response was observed. Results indicate that the 48-hour EC_{50} is greater than the highest concentration tested (100 mg/L Nominal, which corresponds to >73 mg/L measured as isenthionate). Water quality parameter ranges were 19.5-24.5°C for temperature, 7.9-8.4 for pH, 7.0-7.9 for dissolved oxygen, and 158-178 for total hardness (as $CaCO_3$). Analysis of stock solution and test solutions indicate that the desired conditions were achieved initially but there was some loss of test substance after 48 hours. The table shows results of the chemical analyses:

Stock Solutions		
Nominal Concentrations (mg/L)	Actual Concentrations (mg/L)	
1000	991	
Test Solutions		
Nominal Concentrations	Actual Concentrations	
	0 hour	48 hour
0	0.04	0.09
1	0.88	0.05
10	9.4	3.3
56	53.8	41.0

Water temperature exceeded that stipulated in the protocol but results were similar to those obtained in the rangefinder.

Source: Turner, C.A. 1984. The acute toxicity of DEFI Base to *Daphnia magna*. Unilever Research, Port Sunlight Laboratory, Report No. AT/RS43/02.

Reliability: (2) valid with restrictions. Slight exceedance of water temperature range and lack of dose response.

(c)

Type: Static
Species: *Daphnia magna* (Crustacea)
Endpoint: immobility
Exposure period: 48 hours
Unit: mg/L **Analytical monitoring:** no
EC_{50}: 30
Method: DIN 38 412, Part I and Part II. Daphnia were exposed to the test material in solution for 48 hours at concentrations of 1, 5, 10, 20, 50 and 100. The endpoint was immobility.
Year Conducted: 1994 **GLP:** unknown
Test substance: Hostapon SCI, consisting mainly of sodium coconut isethionate (85-89% by weight) with lower levels of coco fatty acids (≤2.5%) and sodium isethionate (10.5%) and sodium sulfate (≤1%).

Results: Results for 24 and 48 hours are shown in the following tables:

	Concentrations (mg/L)	
	24 hours	48 hours
EC_0	10	5
EC_{10}	25	10
EC_{50}	70	30
EC_{100}	500*	250*

* Estimated

Concentration (mg/L)	Percent immobilized	
	24 hours	48 hours
1	0	0
5	0	0
10	0	10
20	20	25
50	30	35
100	70	90

Source: Bucking, H.-W. and Ivanovic, D. 1994. Determination of the effect of substances on Daphnia. Hoechst Aktiengesellschaft. Report No. A 506-1. (in German)

Reliability: (2) valid with restrictions. Some details missing from report.

4.3 Toxicity to Aquatic Plants e.g. Algae

Species: *Chlorella vulgaris* (Unicellular Green Algae)
Endpoint: growth rate and biomass
Exposure period: 72 hours
Unit: mg/L **Analytical monitoring:** yes
EC_{50}(growth): = 9.6 (95% c.i. 8.0-10.8)
EC_{50}(biomass) = 10.2 (95% c.i. 8.4-13.5)
Method: Axenic batch cultures of *C. vulgaris* 211/11b were exposed to five concentrations of DEFI Base (nominal 4.2, 10, 13, 18, and 32 mg/L as isethionate) in 'Bold's Basal Medium'. Cultures were shaken at 175 rpm under continuous illumination of 5800-7500 lux at a temperature of 21-24°C. Algal cell density was measured by absorbance at 440 nm. The pH was maintained at 6.6 ± 0.3 for the duration of the test. Absorbance of the inoculum at test initiation was 0.478 at 440 nm. From this sub-culture 1.0 mL was inoculated into each test and control flask. The test substance was added to the test vessels shortly before the test rather than the day before to minimize the amount of precipitation caused by the DEFI Base which could have reduced the amount of light available to the algal cells at critical growth phases. All test concentratins were run in triplicate.
Year Conducted: 1985 **GLP:** yes
Test substance: DEFI Base (Sample BIOC/82/17), consisting mainly of sodium acyl coconut isethionate (66% by weight) with lower levels of free fatty acid (21%), sodium isethionate (7%) and water (2%).
Remark: Stock solutions were measured as 990 and 100 mg/L isethionate for the 1000 and 100 mg/L nominal concentrations. Measured concentrations using the MBAS method were 0.07, 0.90, 7.5 and 27.6 mg/L isethionate corresponding to the control, 4.2, 13, and 32 mg/L nominal concentrations. The remaining test concentrations were calculated by regression based on these measured values to be 4.71, 6.93 and 14.05 mg/L isethionate for the 7.5, 10 and 18 mg/L

nominal values respectively. The cell concentration in the control cultures increased by a factor of 100 over 72 hours, confirming study validity (a minimum of 16-fold increase in cell density is required). During the test period, the DEFI Base precipitated out in all test concentrations causing an increase in absorbance which was taken into account by substracting the absorbance of the test substance blanks from the absorbance of the test flasks containing *C. vulgaris*. The EC_{50} values were determined using the GLIM package (v.3.53, Royal Statistical Society, London).

Source: Turner, C.A. 1985. The toxicity of DEFI Base to *Chlorella vulgaris* 211/11b. Unilever Research, Port Sunlight Laboratory, Report No. AL/RS43/02.

Reliability: (2) valid with restrictions. The method and instrumentation for measuring absorbance is not reported.

4.4 Toxicity to Microorganisms e.g. Bacteria

Type: aquatic
Species: anaerobic bacteria from a domestic water treatment plant
Exposure period: 3 hours
Unit: mg/L **Analytical monitoring:** yes
EC_{20}: 639
EC_{50}: >1000
Method: The study was conducted in accordance with OECD Guideline 209 and 88/302/EWG (Part C), EG Official Journal L 133 (1988), S. 118-122. The test substance was weighed directly into the test chammbers at concentrations ranging from 62.5 to 1000 mg/L. The inoculum was activated sludge from a local Frankfurt wastewater treatment plant. The test substance was incubated at 20°C for 3 hours and then assessed for effect on respiration according to the EEC Directive. A control was also tested, as was a reference substance (3,5-dichlorophenol) at concentrations of 5, 20 and 30 mg/L. The pH was maintained at 7.2±0.2 for the duration of the study.
Year Conducted: 1994 **GLP:** yes
Test substance: Sodium cocoyl isethionate; Batch 1 (7.93) 331302; 68.7% purity; 25% free fatty acid and stearic acid.
Remarks: The test substance did not inhibit microorganism activity at the highest concentration tested (1000 mg/L).
Source: Reinhardt, J. 1994. Examination of the effects of Hostapon SCID to bacteria (bacterial toxicity). Hoechst AG Biological Laboratory. Study No. 94-0010-11.
Reliability: (2) Valid with restrictions. Letter report of well conducted GLP study.

4.5 Chronic Toxicity to Aquatic Organisms

4.5.1 Chronic Toxicity to Fish

Type: Estimation by ECOSAR
Species: Fish
Endpoint: Mortality
Exposure period: Not reported
Unit: mg/L **Analytical monitoring:** no
ChV: 10.903
Method: Calculated based on Esters class
Year Conducted: 2006 **GLP:** no

Test substance: Sodium cocoyl isethionate; Molecular weight = 386.53
Remark: Predicted chronic value (ChV) using estimated log Kow of 2.38 and calculated water solubility of 704 mg/L.
Source: ECOSAR v.0.99g
Reliability: (2) Valid with restrictions. Standard EPA Estimation software.

4.5.2 Chronic Toxicity to Aquatic Invertebrates

Remark: No data available

TERRESTRIAL ORGANISMS

4.6.1 Toxicity to Soil Dwelling Organisms

Remark: Not an HPV Challenge endpoint.

4.6.2 Toxicity to Terrestrial Plants

Remark: Not an HPV Challenge endpoint.

4.6.3 Toxicity to other Non-Mamm. Terrestrial Species

Remark: Not an HPV Challenge endpoint.

4.7 Biological Effects Monitoring

Remark: Not an HPV Challenge endpoint.

4.8 Biotransformation and Kinetics

Remark: Not an HPV Challenge endpoint.

4.9 Additional Remarks

Remarks: None

5.1 Acute Toxicity

5.1.1 Acute Oral Toxicity

(a)

Type: LD50
Species: rat (Sprague-Dawley albino)
Sex: male/female
Number of Animals: 5 per sex
Vehicle: The test material was mixed with distilled water to form a uniform suspension at a concentration of 0.25 g/mL. The dose volume delivered was 20 mL/kg of body weight.
Value: > 5000 mg/kg bw
Method: Young adult male and female albino rats (5 per sex) were exposed to a single dosage level of 5000 mg/kg. Food and water were available throughout the study period except for a fasting period of approximately 16 to 22 hours prior to test material administration when food, but not water, was withheld. Test animals were housed by sex in groups of five and identified by animal number and corresponding ear tag. Because the test material is a white, waxy solid, it was administered by oral gavage as a suspension as described above. Average weight of animals was 229 and 244 grams prior to fasting and 206 and 229 grams following fasting, for males and females, repectively. Each animal was observed for clinical signs and mortality at 1, 2.5, and 4 hours after test material administration, and daily thereafter for 14 days. Animals were maintained in a temperature and humidity-controlled animal room at 20-23°c and 47-56% relative humidity.
Year conducted: 1986 **GLP:** yes
Test substance: Identified in the study report as 756.05 and by Unilever as 47.5% sodium cocoyl isethionate in a syndet bar. Test material was a white waxy solid.
Results: No mortality was observed with either sex over the duration of the 14 day observation period. Terminal body weights averaged 347 and 271 grams for male and female rats, respectively. One male animal exhibited diarrhea and another exhibited red-stained face, and possible respiratory congestion at 1, 2.5 and 4 hours, but these symptoms disappeared by day 1 and were not observed for the remainder of the study. Similarly, all female rats experienced one or more symptoms including red-stained face, diarrhea, or hypoactivity, but these symptoms had largely disappeared by day 1 and completely disappeared by day 2. All male and female animals appeared normal for the remainder of the study.
Remark: The sub-lethal symptoms observed are common and rats adapted Quickly and showed no signs of long-term adverse effects. No discussion of control organisms was reported. The test material includes other components such as free fatty acid, sodium isethionate and water.
Source: Glaza, S.M.1986. Acute oral toxicity in rats. Hazleton Laboratories America Inc., Test Material No. 756.05, Study No. 6090039, Report Date 11/10/86.
Reliability: (2) valid with restrictions

(b)

Type: LD50
Species: rat (Sprague-Dawley CD albino)
Sex: male/female
Number of Animals: 5 per sex

Vehicle: The test material was administered as received without a vehicle.
Value: > 5000 mg/kg bw
Method: Young adult male and female albino rats (5 per sex) were exposed to a single dosage level of 5000 mg/kg. Doses were administered by oral intubation using a 3cc dosing syringe fitted with a ball-tipped intubation needle. Doses were calculated using fasted body weights. Prefasted body weights were 263-298 (average 287.8) grams and 222-249 (average 236.6)grams for males and females, respectively. The average fasted weights were 258.6 and 213.0 grams for males and females, respectively. Food (Purina LaboratoryRodent Diet) and water were available *ad libitum* throughout the study period except for a fasting period of approximately 18 hours prior to test material administration. Test animals were group-housed (six/cage) during equilibration and individually housed during the study. Each animal was identified with a monel ear tag bearing a unique number prior to testing. During the study, animals were maintained at a temperature of 67-76°F, a humidity of 30-70%, and a photoperiod of 12 hours light and 12 hours dark. The test material was a white cream and was administered by oral intubation as received. Each animal was observed for clinical signs and mortality at 1, 2, and 4 hours after dosing and twice daily thereafter for 14 days.
Year conducted: 1985 **GLP:** yes
Test substance: Identified in the study report as 647.01 and by Unilever as 15% sodium cocoyl isethionate in a gel cleanser. Test material was a white cream with a density of 0.9946 g/L.
Results: No mortality was observed with either sex over the duration of the 14 day observation period. All animals exhibited weight gains with average 14-day weights of 352.2 and 256.2 grams for males and females, respectively. One female rat exhibited signs of diarrhea on day 3, but appeared normal both before and after that date. All other animals exhibited no clinical signs during the study.
Remark: No discussion of control organisms was reported. The test material includes other components such as free fatty acid, sodium isethionate and water.
Source: Blaszcak, D.L. 1985. Acute oral toxicity study in rats. Bio/dynamics Inc., Project No. 5607-85. Report date April 19, 1985.
Reliability: (2) valid with restrictions

(c)
Type: LD50
Species: rat (Sprague-Dawley albino)
Sex: male
Number of Animals: 5 per dose level
Value: 8.4 g/kg bw
Method: Male rats were exposed to 5 dose levels (3.3, 4.1, 5.1, 6.4 and 8.0 g/kg) of DEFI at a concentration of 20% using Lever Method No. G.2.2.1. DEFI was administered on day 1 and the animals were observed for mortality and other overt signs on days 1, 2, 3, 4, 7, and 14. Body weights were measured on days 0, 7 and 14. A gross necropsy was performed at study termination.
Year conducted: 1982 **GLP:** not reported
Test substance: Directly Esterified Fatty Isethionate (DEFI), identified by Unilever as a 20% concentration (Sodium cocoyl isethionate). Coded ADF.

Results: Mortality and body weights are shown in the following table:

Dose Level (g/kg)	Daily Mortality							Mean Body Weights (g)		
	1	2	3	4	7	14	Total	Day 0	Day 7	Day 14
8.0	2	1	-	-	-	-	3/5	171	233	275
6.4	-	-	-	1	-	-	1/5	185	242	275
5.1	-	-	-	-	-	-	0/5	181	249	288
4.1	-	-	-	-	-	-	0/5	192	258	279
3.3	-	-	-	-	-	-	0/5	193	261	288

Slight diarrhea was observed in two animals in the 4.1 g/kg dose within 1-2 hours after dosing. Moderate diarrhea was observed in two, four and five animals about 1 hour after dosing in the 5.1, 6.4, and 8.0 g/kg bw doses, respectively. Some lethargy was also observed at about 22 hours in a single animal each at the 6.4 and 8.0 doses. Gross pathology at necropsy revealed no significant findings. Moderate inflammation of the gastric mucosa was observed in the animals that died on day 1 and 2 in the 8.0 g/kg bw dose.

Remark: No discussion of control organisms was reported. The test material is considered to be nontoxic. The LD_{50} value is reported as 8.4 g/kg bw with no confidence limits calculated.

Source: Stern, M. 1982. Acute oral toxicity (LDV). Lever Brothers Research Center, Project No. 608825, Report Date 9/20/82.

Reliability: (2) valid with restrictions. This is a one-page report with limited details provided.

5.1.2 Acute Inhalation Toxicity

Remark: No specific acute inhalation data are available. Inhalation is not expected to be a significant route of exposure for consumers using preparations containing SCI, as products are either solid bars or liquids that are used with water or rinsed off. Inhalation is also not a significant route of occupational exposure because of manufacturing process design and associated engineering controls (Unilever, personal communication). Factory dust levels are controlled due to potential explosivity hazard as well as for standard occupational hygiene purposes.

5.1.3 Acute Dermal Toxicity

Remark: No acute dermal toxicity study is available. However, there are substantial dermal data available in the many skin irritation studies (section 5.2.1). In addition, many human dermal patch test studies have also been conducted (section 5.11). Data are also available on dermal exposure from two repeated dose dermal toxicity studies in rats (section 5.4). From the dermal 14- and 28-day studies it is apparent that no systemic toxicity occurred when dosing up to 36% SCI, equivalent to 2.07 g/kg bw/day for 28 days (>2000 mg/kg). The weight of evidence of these rat data and from the rabbit skin irritation studies in section 5.2.1 (at doses of 5%), plus supporting human experience, is sufficient for assessment purposes. In addition, skin penetration appears to be

low (Howes 1975; Howes and Cordell 1974), thus further reducing the likelihood of acute toxicity via the dermal route.

5.1.4 Acute Toxicity, other Routes

Remark: Not a required OECD or HPV endpoint.

5.2 Corrosiveness and Irritation

5.2.1 Skin Irritation

(a)
Species: rabbit
Concentration: 5%
Exposure: dermal
Exposure Time: 24 hours
Number of Animals: 6
PDII: 2.24
Result: moderately irritating
EC classificat.: not classified
Method: Six healthy white rabbits were each uniquely indentified and prepared by clipping the trunk free of hair. Two 25 cm^2 gauze patches were placed over each of an area of intact skin and abraded skin on each rabbit. Five-tenths of a milliliter of the test material was placed under each patch, which were then secured in place with adhesive tape. The entire trunk of each animal was wrapped with a rubberized elastic cloth to retard evaporation and as an aid in maintaiing test patch position. The animals were immobilized in head stocks for 24 hours, after which the patches were removed. All test sites were wiped with a cloth to prevent further exposure. Skin lesions were evaluated at 24 and 72 hours and scored in accordance with FHSLA 16 CFR 1500 41. During the test period, animals were individually housed in wire bottomed cages in an environmentally controlled room with a 12 hour light/dark cycle. Feed and water were provided ***ad libitum***.
Year conducted: 1984 **GLP:** yes
Test substance: Jordapon CI 5% solution, Lot # 12023 (equivalent to sodium cocoyl Isethionate); opague white viscous liquid.
Remark: Results are shown in the table. The primary irritation index was 2.24, which is moderately irritating.

	Exposure time (hours)	Average Value
Erythema and Eschar Formation		
Intact Skin	24	1.16
	72	0.67
Abraded Skin	24	2.50
	72	2.0
Subtotal		6.33
Edema Formation		
Intact Skin	24	0.17
	72	0
Abraded Skin	24	1.30
	72	1.17
Subtotal		2.64
Total		8.97
Primary Irritation Score		**2.24**

Source: Wo, C. And Shapiro, R. 1984. Primary Skin Irritation. Product Safety Labs, Report No. T-3631.
Reliability: (2) valid with restrictions. Some details of study not reported.

(b)
Species: rabbit
Concentration: 0.5 grams
Exposure: dermal
Exposure Time: 24 hours
Number of Animals: 6
PDII: 4.5
Result: moderately irritating
EC classificat.: not classified
Method: Six healthy New Zealand white rabbits were exposed to the test material on intact and abraded skin following internal method number G.2.3.1. Skin lesions were evaluated at 24 and 72 hours and scored for erythema/eschar and edema. No further details of the test method were provided.
Year conducted: 1986 **GLP:** not reported
Test substance: Sodium Cocoyl Isethionate
Remark: Results are shown in the table. The primary irritation index was 4.5, which is moderately irritating.

	Exposure time (hours)	Average Value
Erythema and Eschar Formation		
Intact Skin	24	2.3
	72	2.0
Abraded Skin	24	3.0
	72	3.0
Edema Formation		
Intact Skin	24	1.7
	72	1.3
Abraded Skin	24	2.3
	72	2.3
Total Score – Intact Skin		1.8
Total Score – Abraded Skin		2.7
Combined Score		**4.5**

Source: Lodestedt, J. 1986. Rabbit Skin Test. Lever Research, Report No. DS 1728.
Reliability: (2) valid with restrictions. Some details of study not reported.

(c)
Species: rabbit
Concentration: 0.5 grams
Exposure: dermal
Exposure Time: 24 hours
Number of Animals: 6
PDII: 2.4
Result: moderately irritating
EC classificat.: not classified
Method: Six healthy New Zealand white rabbits were exposed to the test material as a slurry on intact and abraded skin following internal method number G.2.3.1. Skin lesions were evaluated at 24 and 72

hours and scored for erythema/eschar and edema. No further details of the test method were provided.

Year conducted: 1982 **GLP:** not reported

Test substance: Directly Esterified Fatty Isethionate (DEFI) (Sodium Cocoyl Isethionate, 93.7% active)

Remark: Results are shown in the table. The primary irritation index was 2.4, which is moderately irritating.

	Exposure time (hours)	Average Value
Erythema and Eschar Formation		
Intact Skin	24	1.3
	72	0.3
Abraded Skin	24	0.7
	72	2.3
Edema Formation		
Intact Skin	24	1.3
	72	0.7
Abraded Skin	24	1.3
	72	1.7
Total Score – Intact Skin		0.9
Total Score – Abraded Skin		1.5
Combined Score		**2.4**

Source: van Baaren, L. 1982. Rabbit Skin Test. Lever Research, Report No. DS 0734, Project No. 608825.

Reliability: (2) valid with restrictions. Some details of study not reported.

(d)

Species: rabbit
Concentration: 0.4 mL
Exposure: dermal
Exposure Time: 24 hours
Number of Animals: 6 (3 male, 3 female)
PDII: 0.4 (non-irradiated); 0.5 (irradiated)
Result: mildly irritating
EC classificat.: not classified
Method: Six healthy young adult white rabbits were each uniquely indentified with a monel ear tag. The test material was administered as a 2% mixture in distilled water. The hair of each rabbit was closely clipped from the back with an electric clipper. Two test sites, one on each side of the spinal column, were used. Four-tenths of a milliliter of the test material was applied to each site beneath a Hilltop Chamber®. Plastic sheeting was then wrapped around the animal and secured with tape to retard evaporation and keep the test substance in contact with the skin. Elizabethan collars were placed on the animals to prevent disruption of the wrappings and ingrestion of the test material. The animals were returned to their cages for observation. Approximately 2 hours after application, the occluding material was removed. The patch on the right side of the animal was removed and the patch on the left side was covered with aluminum foil. The animals were then placed in a partitioned cart designed to hold two animals per section under the radiation source for the UV exposure period. The right side was then exposed for 30 minutes to light emitted from a bank of four GE F-40BLB ultraviolet lights

positioned approximately 6 inches above the dose site. Activity was monitored continuously during irradiation. Following exposure, the patches were replaced on the right side, the foil was removed from the left side and the animal was wrapped with plastic sheeting which was secured with tape. Approximately 24 hours after the initial application of the test material, the wrappings and patches were removed, and the sites wrapped with damp gauze. During the test period, animals were individually housed in suspended stainless steel cages in an environmentally controlled room at 60-70°F with a 12 hour light/dark cycle. Humidity was maintained between 30-70%. Feed (Lab Rabbit Chow HF)and water were provided *ad libitum*. In addition to the test preparations, one rabbit received similar treatment with the positive control material, 8-methoxysoralen (1%). All sites were graded using the Draize Scoring scale at 1 hour after test article removal (reported as the 24 hour grade), 48 and 72 hours after the initial application. A modified primary irritation score was calculated for both irradiated and non-irradiated sites by adding the average erythema and edema scores for each of the three observation intervals and dividing this total by 3.

Year conducted: 1986 **GLP:** yes

Test substance: Test material 757.05, identified as 47.5% sodium cocoyl isethionate in a syndet soap; white waxy solid.

Remark: Results are shown in the table. Only slight (barely perceptible) erythema with no edema was observed for all treated sites, both with and without irradiation, at 24 hours. Four of the six animals were free of dermal irritation at 48 hours and two animals exhibited very slight erythema at 48 and 72 hours. Responses at the irradiated sites were comparable to those at non-irradiated sites. The primary irritation index for the test substance was 0.4 (non-irradiated) and 0.5 (irradiated), which is mildly irritating.

	Exposure time (hours)	Average Value
Erythema and Eschar Formation		
Irradiated site	24	1.0
	48	0.3
	72	0.2
Subtotal		***1.5***
Non-irradiated site	24	1.0
	48	0.3
	72	0.0
Erythema/Eschar Subtotal		***1.3***
Edema Formation		
Irradiated site	24	0.0
	48	0.0
	72	0.0
Subtotal		***0.0***
Non-irradiated site	24	0.0
	48	0.0
	72	0.0
Edema Subtotal		***0.0***
Primary Irritation Score (Irradiated Site)		**0.5**
Primary Irritation Score (Non-Irradiated Site)		**0.4**

Source: Blaszcak, D.L. 1987. Phototoxicity and Primary Skin Irritation in Rabbits. Bio/Dynamics Inc., Project No. 6869-86.

Reliability: (1) valid without restriction.

(e)
Species: rabbit
Concentration: 5%
Exposure: dermal
Exposure Time: 24 hours
Number of Animals: 6
PDII: 1.38
Result: mildly irritating
EC classificat.: not classified
Method: Six healthy New Zealand white rabbits, weighing approximately 2 kg and about 3 months of age, sex unspecified, were each uniquely indentified and prepared by clipping the hair from the mid-dorsal area of the trunk, between the scapulae and the pelvis, using a small animal clipper equipped with a #40 (surgical) head. Animals were placed in wooden restrainers and two test sites, each 2.5 cm^2, were selected on opposite sides of the vertebral column. The test site on the left side remained intact; the test site on the right side was abraded with a sterile 22 gauge hypodermic needle. The abrasions were longitudinal epidermal incisions, sufficiently deep to penetrate the stratum corneum, but not so deep as to destroy the integrity of the derma. A single application of 0.5 mL of the test material was made to each site and then covered with 2.5 cm^2 surgical gauze held in place with adhesive tape. The entire trunk of each animal was wrapped with an impermeable occlusive wrapping to maintain test patch position and prevent evaporation of possible volatile components of the test substance. The wrapping and test material was removed 24 hours after application and the site gently wiped to prevent further exposure. The skin was examined at 24 and 72 hours for erythema and edema using the Draize skin scoring scale. During the test period, animals were individually housed in stainless steel or galvanized cages in an environmentally controlled room with a 12 hour light/dark cycle. Feed and water were provided *ad libitum*.
Year conducted: 1984 **GLP:** yes
Test substance: Identified as sodium cocoyl isethionate, 5% solution, pH 5.3
Remark: Results are shown in the table. The primary irritation index was 1.38, which is mildly irritating.

	Exposure time (hours)	Average Value
Erythema and Eschar Formation		
Intact Skin	24	1.7
	72	0.0
Abraded Skin	24	1.8
	72	0.0
Edema Formation		
Intact Skin	24	1.0
	72	0.0
Abraded Skin	24	1.0
	72	0.0
Combined Averages		5.5
Primary Irritation Score		**1.38**

Source: Nitka, S. and Palanker, A.L. 1984. Primary Dermal Irritation in Rabbits. Consumer Product Testing Company Inc., Study No. 84171-2.
Reliability: (2) valid with restrictions. Some details of study not reported.

5.2.2 Eye Irritation

(a)
Species: rabbit
Concentration: not reported
Dose: 55 mg
Exposure Time: 5 minutes
Number of Animals: 3
Result: irritating
EC classificat.: not classified
Method: DEFI was administered to the eyes of three New Zealand white Rabbits in 5 minute exposures following internal method G.2.3.2. No further information on the method was provided.
Year: 1983 **GLP:** not reported
Test substance: Directly Esterified Fatty Isethionate (DEFI)(sodium cocoyl isethionate)
Remark: DEFI produced a corneal opacity and transient iritis in one animal during the first 72 hours after treatment. The opacity was still present on day 7 but healed completely by day 14. The two other treated animals exhibited slight iridal and conjunctival irritation that healed completely by day 7. Based on the corneal and iridal involvement in one of the 3 animals during the initial phase of the study, the test substance should be considered an eye irritant. The results are shown in the following table:

Average Weighted Draize Score (Scale 0-110)					Avg. Draize Score (0-72 hr)	Fluorescein Avg. In. x Avg. Area		
24 hr	48 hr	72 hr	7 days	14 days		72 hr	7 days	14 days
12.3	9.0	9.1	1.7	0.0	10.1	0.09	0.0	0.0

Source: van Baaren, L. 1983. Rabbit Eye Test, Data Evaluation Summary. Lever Research. Project No. 608825, Report No. DS 0914.
Reliability: (2) valid with restrictions. Some details not reported.

(b)
Species: rabbit
Concentration: 0.1 mL
Dose: 15%
Exposure Time: Single application on Day 0
Number of Animals: 6 (2 male, 4 female)
Result: moderately irritating
EC classificat.: not classified
Method: Six New Zealand white albino rabbits (2.2 to 2.7 kg) were identified

With a monel ear tag bearing a unique number prior to testing. Animals showing pre-existing corneal or conjunctival injury or irritation (as determined with fluoroscein dye) were not placed in the study. One tenth milliliter (0.1 mL) of the test material was introduced into the lower conjunctival sac of the right eye of each animal. The upper and lower lids were gently held together for one second prior to releasing to prevent loss of material. The left eye served as the control. Animals were observed for any response indicative of discomfort. The treated eyes were examined at Day 0 and on days 1, 2, 3 and 7 for corneal opacity, iritis, conjunctivitis, and other signs of irritation. At Day 1, the treated eyes were also examined for corneal ulceration after

application of sodium fluorescein. If fluorescein retention was seen, observations were continued until there was no stain retention for two observations or the study was terminated. During the test period, animals were individually housed in suspended stainless steel cages in an environmentally controlled room at 60-70°F with a 12 hour light/dark cycle. Humidity was maintained between 30-70%. Feed (Lab Rabbit Chow HF) and water were provided *ad libitum*. No indication of eye rinsing is reported.

Year: 1985 **GLP:** not reported

Test substance: Test Material 648.01, indentified as 15% sodium cocoyl isethionate in a gel cleanser; white cream.

Remark: The test material produced moderate and transient ocular irritation.

Most animals exhibited moderate conjunctival irritation (redness, chemosis, discharge), iridial changes, and corneal opacities, ulceration and stippling. One animal was free of any ocular irritation within 7 days after instillation of the test material. The five remaining animals exhibited slight conjunctival irritation but were free of any corneal irritation at study termination (day 7). No apparent discomfort was noted at the time of instillation. The maximum average score, which occurred on day 1, was 23.3. The test material is considered to be an eye irritant as defined by 16 CFR 1500.3(c) Consumer Product Safety Commission regulations. The results are shown in the following table:

Average Weighted Draize Score (Scale 0-110)					Avg. Draize Score (0-72 hr)
24 hr	48 hr	72 hr	7 days	14 days	
23.3	14.3	7.0	1.7	0.0	14.9

Source: Blaszcak, D.L. 1985b. Eye Irritation Study in Rabbits (FHSA). Bio/Dynamics Inc., Project No. 5617-85.

Reliability: (2) valid with restrictions. Some details not reported.

(c)

Species: rabbit
Concentration: 10 µL
Dose: 15%
Exposure Time: Single application on Day 0
Number of Animals: 6 (2 male, 4 female)
Result: mildly irritating
EC classificat.: not classified
Method: Six New Zealand white albino rabbits (2.5 kg) were identified With a monel ear tag bearing a unique number prior to testing. Animals showing pre-existing corneal or conjunctival injury or irritation (as determined with fluoroscein dye) were not placed in the study. A low volume (10 µL) of the test material was placed directly on the cornea of one eye of each animal, using a Hamilton 50 µL syringe. The eyelid was released immediately after Instillation without forced blinking or manipulation. Animals were observed for any response indicative of discomfort. The treated eyes were examined at Day 0 and on days 1, 2, and 3 for corneal opacity, iritis, conjunctivitis, and other signs of irritation. At Day 1, the treated eyes were also examined for corneal ulceration after application of sodium fluorescein. If fluorescein retention was seen, observations were continued until there was no stain retention for two observations or the study was terminated. During

the test period, animals were individually housed in suspended stainless steel cages in an environmentally controlled room at 60-70°F with a 12 hour light/dark cycle. Humidity was maintained between 30-70%. Feed (Lab Rabbit Chow HF) and water were provided *ad libitum*. No indication of eye rinsing is reported.

Year: 1985 **GLP:** not reported

Test substance: Test Material 649.01, indentified as 15% sodium cocoyl isethionate in a gel cleanser; white cream.

Remark: The test material was mildly irritating to the eye. Irritation seen was very slight conjunctival irritation (redness, chemosis), in five of the six animals at days 1 and 2. No apparent discomfort was noted at the time of instillation. The maximum average score was 3.0, which occurred on day 1. The test material is not considered to be an eye irritant as defined by 16 CFR 1500.3(c) Consumer Product Safety Commission regulations. The results are shown in the following table:

Average Weighted Draize Score (Scale 0-110)			Avg. Draize Score (0-72 hr)
24 hr	48 hr	72 hr	
3.0	2.0	1.0	2.0

Source: Blaszcak, D.L. 1985c. Eye Irritation Study in Rabbits (Low Volume Procedure). Bio/Dynamics Inc., Project No. 5627-85.

Reliability: (2) valid with restrictions. Some details not reported.

(d)

Species: rabbit

Concentration: 2.5%

Dose: 0.1 mL

Exposure Time: Single application on Day 0

Number of Animals: 6

Result: mildly irritating

EC classificat.: not classified

Method: Six New Zealand white albino rabbits (approximately 2.0 kg, 3 Months of age) were identified with a monel ear tag bearing a unique number prior to testing. Immediately prior to test initiation, the animals were placed in wooden restrainers. A dose of one-tenth milliter (0.1 mL) of the test material (2.5% gravimetric aqueous suspension) was placed into one eye of each animal by gently pulling the lower eyelid away from the eyeball to form a cup into which the test material was added. The eyelids were gently held together for one second. The contralateral eye remained untreated and served as the control for each animal. If any of the test material remained in the eye after 24 hours, the eye was washed out with lukewarm water after the 24 hour reading. Observations of ocular irritation were recorded at 24, 48 and 72 hours following instillation of the test material. Additional readings were made at 4 and 7 days after application if irritation persisted. If two or more animals exhibited a positive reaction, the test material was considered an ocular irritant. During the test period, animals were individually housed in suspended stainless steel cages. Food and water were provided *ad libitum*.

Year: 1982 **GLP:** yes

Test substance: Identified as sodium cocoyl isethionate, 2.5% solution.

Remark: The test material was mildly irritating to the eye. The only Signs of irritation observed was slight conjunctival redness. The results are shown in the following table:

Average Weighted Draize Score (Scale 0-110)				Avg. Draize Score (0-72 hr)
24 hr	48 hr	72 hr	4 days	
3.0	2.0	1.0	0.0	2.0

Source: Nitka, S. and Palanker, A.L. 1982b. Primary Ocular Irritation in Rabbits. Consumer Product Testing Company Inc., Study No. 8208.
Reliability: (2) valid with restrictions. Some details not reported.

(e)
Species: rabbit
Concentration: 47.5%
Dose: 100 mg
Exposure Time: Single application on Day 0
Number of Animals: 6
Result: moderately irritating
EC classificat.: not classified
Method: Six New Zealand white albino rabbits were identified with an ear tag bearing a unique number prior to testing. The animals' eyes were examined on the day before dosing using sodium fluorescein, then again immediately prior to test initiation to ensure only those animals with no sign of ocular irritation or injury were used in the test. Prior to dosing, the test material was ground through a wire mesh sieve and weighed out as a fine powder. The eyelids were gently held open and 100 mg of the test material was placed on the everted lower lid of one eye of each rabbit, wit the contralateral eye serving as the untreated control. The upper and lower lids were gently held together for one second to prevent loss of material and then released. The treated eyes of the rabbits remained unflushed. Observations of ocular irritation were recorded at Days 1, 2, 3, 4 and 7. At each reading, sodium fluorescein was used to aid in revealing possible corneal injury. Grading and scoring of irritation was performed using the Draize technique. The animal room was maintained at 22-27°C and a relative humidity of 56-79% for the study duration.
Year: 1986 **GLP:** yes
Test substance: Sample No. 758.05, identified as sodium cocoyl isethionate, 47.5% solution; white, waxy solid.
Remark: The test material was moderately irritating to the eye. The maximum average score (MAS) was 34.2 and occurred on Day 1. Blanching of the conjunctivae was seen in all animals at Day 1, in two animals at Day 2, in three animals at Day 3, and one animal at Days 4 and 7. Corneal epithelial peeling was observed in all animals on Days 1 and 2, in five animals at Days 3 and 4, and in four animals at Day 7. Other signs observed in some animals included necrosis, pannus, and corneal neovascularization. The results are shown in the following table:

Average Weighted Draize Score (Scale 0-110)					Avg. Draize Score (0-72 hr)
Day 1	Day 2	Day 3	Day 4	Day 7	
34.2	31.0	28.8	28.0	20.3	2.0

Source: Glaza, S.M. 1986b. FHSA – Eye Irritation in Rabbits. Hazleton Laboratories America Inc. Sample No. 60900402.
Reliability: (2) valid with restrictions. Some details not reported.

(f)
Species: rabbit
Concentration: 5%
Dose: 0.1 mL
Exposure Time: Single application on Day 0
Number of Animals: 9
Result: mildly irritating (unwashed); minimally irritating (washed)
EC classificat.: not classified
Method: Nine New Zealand white albino rabbits were each uniquely identified and then immobilized in head stocks. One-tenth of a milliliter of the test material was placed on the everted lower lid of one eye of each rabbit. The upper and lower lids were gently held together for one second before releasing to prevent loss of the test material. The other eye of each rabbit remained untreated and served as the control. The treated eyes of three rabbits were irrigated with 20 mL of lukewarm water 30 seconds after the instillation of the test material. The eyes of the remaining six rabbits were not irrigated. Grading and scoring of irritation was performed using the Draize technique at 24, 48 and 72 hours. During the test period the animals were individually housed in stainless steel wire bottomed cages in an environmentally controlled room with a 12 hour light/dark cycle. Food and water were provided *ad libitum*.
Year: 1984 **GLP:** yes
Test substance: Jordapon CI 5% solution, Lot #12023. (sodium cocoyl isethionate); opague white viscous liquid.
Remark: The test material was mildly irritating to the unwashed eye and minimally irritating to the washed eye. The maximum mean total scores (MMTS) were 12.0 and 8.33 for the unwashed and washed eyes, respectively.
Source: Wo, C. and Shapiro, R. 1984b. Draize Primary Eye Irritation. Product Safety Labs. Report No. T-3703.
Reliability: (2) valid with restrictions. Some details not reported.

5.3 Sensitization

(a)
Type: sensitization
Species: guinea pig
Number of Animals: 20 (test group); 10 (control group)
Vehicle: distilled water
Result: not sensitizing
Method: Modified Buehler Test. Hartley albino guinea pigs (weight 275 to 325 g) were housed singly in wire mesh suspension cages and were identified individually by numbered cage cards. The animals were provided tap water and food (Purina guinea pig chow) *ad libitum* and maintained on a 12 hour light/dark photoperiod.

Primary Irritation: During the irritation phase, the test material was applied to four animals to determine the concentration appropriate for use during the primary challenge. The material was tested as 2.0, 1.5, 1.0, and 0.5% w/v formulations in distilled water. Prior to application, the hair on the backs of the animals was clipped and the animals were placed in stainless steel restrainers and patches applied to each animal. The patches, incorporating a 25 mm Hill Top Chamber, were moistened with 0.3 mL of one of the formulations. The patches were occluded with dental dam placed over the back of each animal and secured with metal clips. The animals were restrained for 6 hours and then returned to their cages. On the day following application, the clipped areas were depilated with NEET Cream Hair Remover, which was allowed to remain on the sites for eight minutes and then washed off with warm tap water. The patch sites were scored for severity of response at 24 and 48 hours. A concentration of 2.0% w/v in distilled water was determined for use at induction and was also chosen for use at the primary challenge.

Induction of Sensitization: On the day prior to induction, the upper left quadrant of the backs of guinea pigs was clipped free of hair with electric clippers. On the following day chambers moistened with 0.3 mL of the test material prepared as a 2.0% w/v formulation in distilled water were applied to 20 guinea pigs (10 male, 10 female) for six hours, after which the patches were removed and the animals returned to their cages. The chambers were reapplied to the same site once each week for a total of three applications. The same site was clipped on the day before each application and the restraint periods lasted for six hours on each occasion. The induction sites were scored for severity of response 24 hours after each induction and at the time of the 24 hour scoring of the primary challenge.

Primary Challenge: Approximately two weeks after the last of the three induction applications, a fresh application site was prepared by clipping the lower left quadrant of the backs of the test and naïve control animals. On the next day, a challenge patch moistened with 0.3 mL of the test material as a 2.0% w/v formulation in distilled water was applied to each animal. The animals were restrained for six hours after which the patches were removed and the animals returned to their cages. On the day after application, the sites were depilated for eight to eleven minutes and scored 2-1/2 hours later. The sites were also scored at 48 hours (without additional depilation).

Year Conducted: 1986 **GLP:** yes

Test substance: Sample No. 764.02, identified as 47.5% sodium cocoyl isethionate in a syndet bar; white, waxy solid.

Remark: The incidence of grade ± responses in the test group (9 of 20) was compared to that of the naïve test group (7 of 10) at primary challenge. The incidence and severity of the responses was comparable to that produced by the naïve control group, indicating that sensitization had not been induced. The severity of the responses following the primary challenge are shown in the table:

	Mean Severity Scores	
	24 hours	**48 hours**
Test material	0.2	0.1
Naïve control	0.3	0.2

Source: Buehler, E.V. 1986. Delayed contact hypersensitivity study in

guinea pigs. Hill Top Research, Project No. 86-1219-21.

Reliability: (1) valid without restriction. Well documented GLP report.

(b)

Type: sensitization

Species: guinea pig

Number of Animals: 20 (test group); 10 (control group)

Vehicle: distilled water

Result: not sensitizing

Method: Modified Buehler Test. Hartley albino guinea pigs were used.

Primary Irritation: During the irritation phase, the test material was applied to four animals (2 male, 2 female) to determine the concentration appropriate for use during the primary challenge. The material was tested as 70, 50, 30 and 10% w/v formulations in distilled water. Prior to application, the hair on the backs of the animals was clipped and the animals were placed in restrainers and patches applied to each animal. The patches were moistened with 0.3 mL of one of the formulations, and occluded. On the day following application, the clipped areas were depilited for eight minutes and then washed off. The patch sites were scored for severity of response at 24 and 48 hours. A concentration of 70% w/v in distilled water was determined for use at induction.

Induction of Sensitization: On the day prior to induction, the backs of guinea pigs were clipped free of hair. On the following day, 0.3 mL of the test material prepared was applied to 20 guinea pigs(10 male, 10 female) and occuluded. At first induction, the animals were inadvertently dosed with 100% w/v formulation instead of 70%. Reapplication of the test material at 70% w/v formulation was performed on the same site once each week for a total of three applications. The same site was clipped on the day before each application and the animals restrained on each occasion. The induction sites were scored for severity of response 24 hours after each induction and at the time of the 24 hour scoring of the primary challenge. Based on these results, a concentration of 50% w/v in distilled water was chosen for use in the primary challenge phase.

Primary Challenge: Approximately two weeks after the last of the three induction applications, a fresh application site was prepared by clipping the backs of the test and naïve control animals. On the next day, a challenge patch moistened with 0.3 mL of the test material as a 50% w/v formulation in distilled water was applied to each animal. The animals were restrained for six hours after which the patches were removed. On the day after application, the sites were depilated for eleven minutes and scored approximately 2-1/2 hours later. The sites were also scored at 48 hours.

Year Conducted: 1985 **GLP:** yes

Test substance: Sample No. 646.01, identified as 15% sodium cocoyl isethionate in a gel cleanser; white cream.

Remark: Their were no responders (score ≥ 1) in a group of 20 guinea pigs previously exposed to one induction of 100% and two inductions of a 70% preparation of the test material in distilled water. There were no responders in the control group, indicating that sensitization had not been induced. The severity of the responses following the primary challenge are shown in the table:

	Mean Severity Scores	
	24 hours	48 hours
Test material	0.1	0.0
Naïve control	0.3	0.2

Source: Hiles, R.A. and Liao, J.T.F. 1985. Delayed contact hypersensitivity (Buehler Method – Modified). Springborn Institute for Bioresearch, Lab Study No. 3098.240.

Reliability: (2) valid with restrictions. GLP study but available report is incomplete and lacks description of test method, etc. However, raw data tables are present and provide additional detail that support a valid study. One deviation occurred that did not appear to impact the result.

(c)

Type: sensitization

Species: guinea pig

Number of Animals: 20 (test group); 10 (control group)

Vehicle: distilled water

Result: not sensitizing

Method: This Modified Buehler Test was conducted in accordance with EG Guideline B.6, OECD Guideline 406, and GLP procedures. Pirbright albino guinea pigs (weight 316 to 403 g) were housed singly in wire mesh suspension cages and were identified individually by skin markings and numbered cages. The animals were provided tap water and food *ad libitum*.

Primary Irritation: During the irritation phase, the test material was applied to six animals to determine the concentration appropriate for use during the primary challenge. The material was tested as 100, 50 and 25% w/v formulations in distilled water. Prior to application, the hair on the left side backs of the animals was clipped and 2 x 2 cm patches applied to each animal. The patches were moistened with 0.5 g of one of the formulations or 0.5 mL of the control. The patches were covered for 6 hours with an occlusive bandage. On the day following application, the patch sites were scored for severity of responses. A concentration of 100% w/v in distilled water was determined for use at induction and was also chosen for use at the primary challenge.

Induction of Sensitization: On the day prior to induction, the upper left quadrant of the backs of guinea pigs was clipped free of hair. 0.5 g of the test material prepared as a 100% w/v formulation in distilled water were applied under 2 x 2 cm patches to 20 guinea pigs (10 male, 10 female) for six hours, after which the patches were removed and the area rinsed with lukewarm water. 0.5 mL of the control solution was similarly applied to the 10 control animals (5 male, 5 female). Reapplication of the test material at 100% w/v formulation was performed on the same site once each week for a total of three applications. The induction sites were scored for severity of response.

Primary Challenge: Approximately two weeks after the induction application, a fresh application site was prepared by clipping the untreated area of the lower right flank of the test and naïve control animals. A challenge patch moistened with 0.5 g of the test material as a 100% w/v formulation in distilled water was applied to each animal, occluded for six hours, and removed as was

done in the induction phase. At 24 and 48 hours after application the sites were scored for dermal reactions and the animals weighed.

Year Conducted: 1994 **GLP:** yes

Test substance: Hostapon SCID (Batch 1, July 1993), consisting mainly of sodium coconut isethionate (66% by weight) with lower levels of stearic acid (19 ± 2%), coco fatty acids (7 ± 2%) and sodium isethionate (max 4%). Purity, 68.7% SCI and 25.0% free fatty acid; yellowish to white flakes.

Remark: No reactions were observed during the challenge phase, indicating that sensitization had not been induced.

Source: Bury, Dr. 1994. Hostapon SCID: Examination of sensitization characteristics to Pirbright white guinea pigs following Buehler. Hoechst Aktiengesellschaft, Report No. 94.0102, Project No. 93.0741. (in German)

Reliability: (1) valid without restriction. Well documented GLP report.

(d)

Type: sensitization

Species: guinea pig

Number of Animals: 10 (test group); 8 (control group)

Vehicle: saline for injection and polyethylene glycol 400/distilled water for topical induction and challenge

Result: not sensitizing

Method: The Guinea Pig Maximizatin Test (GPMT), performed according to the Magnusson and Kligman method, was used. The animals weighed approximately 320 grams. The GPMT method involves induction in Guinea pigs by intradermal injections of both test substance and Freunds complete adjuvant. The induction process is supplemented seven days later by test substance applied to the shoulder injection sites and occluded by patch. Fourteen days later the animals were challenged by occluded patch on one flank. In this particular study, three subsequent challenges were then performed.

Primary Irritation: The test material was applied to four animals to determine the concentrations appropriate for use in the induction phase and for the primary challenge. A concentration of 0.15% was selected for intradermal induction. A concentration of 20% was a suitably irritating concentration for topical induction and 5% was the highest non-irritant topical concentration and was selected for the challenge.

Induction of Sensitization: Intradermal injections to induce sensitization were performed with 0.15% test material. Six 0.1 mL intradermal injections were made within a 2 x 4 cm area of the shoulder region. The skin at the site of all intradermal injections was clipped on the morning of the injections. Topical induction was performed at 20% of test material by saturating an 8 mm diameter filter paper in 11 mm "fintest" aluminum patch test cups and applying to the induction sites on the neck of four previously untreated animals of the same sex weighing approximately 450 g.

Primary Challenge: The subsequent topical challenge was at 5.0%. Again, 8 mm diameter filter papers in 11 mm "fintest" aluminum patch test cups were saturated with the test material, then applied to the shaved flank challenge sites. The patches were held in place by adhesive plaster wound around the trunk of the Guinea pig. After 24 hours, patches were removed and reactions were scored at

both 24 and 48 hours after removal.

Year Conducted: 1978 **GLP:** no

Test substance: Hostapon KA, Sample No. 10605. Fatty acid sulphonic acid, with no further sample characterization available.

Remark: Three additional challenges were performed after the initial challenge. After the first challenge, 1 of 10 animals had a faint/very faint reaction at 24 hours and 2 of 10 animals showed the same reaction at 48 hours. After the second challenge, 2 of 10 animals had a faint/very faint reaction at 24 hours and 1 of 10 possibly showed the same reaction at 48 hours. After the third challenge, no animals showed any reactions. After the fourth challenge, 1 of 8 animals had a faint/very faint reaction at 24 hours with a further 1 of 8 with possible reactions, and 1 of 8 animals showed the same reaction at 48 hours. At this fourth challenge, two test animals died due to neck lesions from the induction procedure. The mortalities were not due to the topical challenge. Interpretation of the results is difficult due to the number of faint/very faint erythema reactions observed following each challenge. Some reactions were also seen in the control animals. Comparing the reactions at 24 hours versus 48 hours and the reproducibility of responses at each challenge, there is some evidence that one (and perhaps two) of the animals may have been weakly sensitized. However, the amount of background irritation in control animals and the weak responses in the test animals point towards this study being inconclusive.

Source: Unilever SEAC study SSM780397, Guinea pig Maximisation Test for skin sensitisation on Hostapon KA.

Reliability: (4) not assignable. No adequate description of the test substance is available. No chemical purity and identification/ quantification of impurities is available. Not performed to GLP or current OECD guideline.

(e)

Type: sensitization

Species: guinea pig

Number of Animals: 10 (test group); 7 (control group)

Vehicle: saline for injection and polyethylene glycol 400/distilled water for topical induction and challenge

Result: not sensitizing

Method: The Guinea Pig Maximizatin Test (GPMT), performed according to the Magnusson and Kligman method, was used. The animals weighed approximately 320 grams. The GPMT method involves induction in Guinea pigs by intradermal injections of both test substance and Freunds complete adjuvant. The induction process was supplemented seven days later by test substance applied to the shoulder injection sites and occluded under a patch. Fourteen days later the animals were challenged by occluded patch on one flank. In this particular study, two subsequent challenges were then performed.

Primary Irritation: The test material was applied to four animals to determine the concentrations appropriate for use in the induction phase and for the primary challenge. A concentration of 0.2% was selected for intradermal induction. A concentration of 2.5% was a suitable irritant concentration for topical induction and 1% was the highest non-irritant topical concentration and was selected for the challenge.

Induction of Sensitization: Intradermal injections to induce sensitization were performed with 0.2% test material. Six 0.1 mL intradermal injections were made within a 2 x 4 cm area of the shoulder region. The skin at the site of all intradermal injections was clipped on the morning of the injections. Topical induction was performed at

2.5% of test material by saturating an 8 mm diameter filter paper in 11 mm "fintest" aluminum patch test cups and applying to the induction sites on the neck of four previously untreated animals of the same sex weighing approximately 320 g.

Primary Challenge: The subsequent topical challenge was at 1.0%. Again, 8 mm diameter filter papers in 11 mm "fintest" aluminum patch test cups were saturated with the test material, then applied to the shaved flank challenge sites. The patches were held in place by adhesive plaster wound around the trunk of the Guinea pig. After 24 hours, patches were removed and reactions were scored at both 24 and 48 hours after removal.

Two types of controls were used. Treated controls consisted of eight animals of the same sex (four for each of the first and second challenges). Animals received four intradermal injections of Freund's complete adjuvant in the test solvent followed seven days later by a 48 hour occluded patch of the test solvent over the injection sites. At the first challenge, four of these animals were challenged with the test substance the same way as the test animals. The second group of four treated control animals were treated in an identical manner at the second challenge. Untreated controls consisted of four previously untreated animals of the same sex and weighing approximately the same as the test animals at each challenge period were treated in exactly the same way as the test animals.

Year Conducted: 1983 **GLP:** no

Test substance: Fenopen AC78, Sample No. 136075. Fatty acid sulphonic acid, with no further sample characterization available.

Remark: Two additional challenges were performed after the initial challenge. After the first challenge, 1 of 10 animals had a faint/very faint reaction at 24 hours and 1 of 10 animals showed the same reaction at 48 hours. After the second challenge, no animals showed any reaction. After the third challenge, 2 of 10 animals had a faint/very faint reaction at 24 and 48 hours. There were some reactions at each challenge to the test substance, but these were invariably of only faint or very faint erythema. However, the increased intensity of reaction at the 48 hour reading versus the 24 hour reading that typifies a genuine allergic response was absent in all cases. There was no clear reproducibility in the appearance of reactions in individual animals between challenges. Based on the above, this study does not provide convincing evidence that any of the animals have been sensitized in the GPMT study. All seven controls responded appropriately.

Source: Unilever SEAC study SSM830078, Guinea pig Maximisation Test for skin sensitisation on Fenopon AC78.

Reliability: (4) not assignable. No adequate description of the test substance is available. No chemical purity and identification/ quantification of impurities is available. Not performed to GLP or current OECD guideline. Test report is difficult to read in places.

5.4 Repeated Dose Toxicity

(a)

Species: rat
Sex: Male/Female
Strain: Charles River COBS CD
Route of admin.: Dermal
Exposure period: 10 days
Frequency of treatment: Daily
Doses: 10.0%, 20.0%, 40.0%, 60.0%
Control Group: yes
NOAEL: 20.0%
LOAEL: 40.0%
Method: A 10-day dermal application study was conducted to determine dosage levels to be used in a 28-day dermal application study (see 5.4(b)). Animals were treated with aqueous concentrations of 10.0, 20.0, 40.0 and 60.0% (w/w) administered daily at a constant volume of 10.0 mL/kg. A control group was treated with distilled water at the same constant volume of dose. The dorsal surface of the animals were shaved one day prior to study initiation. The test material was applied dermally using a disposable syringe, then spread evenly across the test site using a glass rod. The treated area was covered with gauze, which was held in place by adhesive bandage tape for six hours, after which the gauze wrap was removed and the area rinsed clean of any excess test material. The animals were observed twice daily for parameters of response, including gross observation of health and behavior, body weight, food consumption, and dermal irritation at the treated sites.
Year Conducted: 1991 **GLP:** yes
Test substance: Sodium cocoyl isethionate (SCI), 72.4%
Result: Food consumption was calculated for intervals 0-3, 3-7 and 7-10 days. No apparent differences were observed between the treated and control groups between days 3-10. During the first interval (days 0-3), high dose females consumed 32% less then the control, the low dose males ate 50% more than the control animals. These variations are likely related more to the stress of initial dosing than any toxic effect. In addition, collars were used in this study to prevent oral contact with the test site, but these collars also inhibited normal eating patterns and their use was discontinued. There was no notable difference in body weight means between treatment and control groups for either males or females throughout the study. Beginning on day 4, mild dermal irritation (erythema) was observed in one animal in the 60% dose. This irritation increased in severity and incidence through day 7 then leveled off. On day 6, mild dermal irritation was also observed in the 20% and 40% doses, but this disappeared in ensuing days. Gross observation of tissues and vital organs at necropsy failed to reveal any adverse findings related to treatment.
Remark: Based on the level of dermal irritancy observed in this pilot study, it was determined that the highest concentration for the definitive study not exceed 40% w/w (see 5.4(b)).
Source: Mitchell, M. 1991. 10-day dermal application study of sodium cocoyl isethionate. Unilever Research U.S. Inc., New Jersey, Study No. 7782A, Project No. 699191.
Reliability: (2) valid with restrictions. Summary of rangefinding study. Not completely documented but done to GLP standards.

(b)

Species: rat
Sex: Male/Female
Strain: Charles River COBS CD
Route of admin.: Dermal
Exposure period: 28 days
Frequency of treatment: Daily
Doses: 1.0%, 14.0%, 36.0% (0.08, 0.91, 2.07 g/kg bw d)
Control Group: yes
NOAEL: 36.0% (2.07 g/kg bw d)
LOAEL: >36.0% (>2.07 g/kg bw d)
Method: OECD Guideline 410. Prior to the initiation of the 28-day study, SCI was evaluated in a 10-day dermal application rangefinding study (see 5.4(a)). These results were used to determine that the highest concentration in the definitive study should not exceed 40% (w/w) SCI in aqueous suspension(equivalent to approximately 2.07 g SCI/kg bw). At each concentration 400 grams of aqueous suspension was prepared each week of the study. The test material stock solution and aqueous suspensions were analyzed weekly and it was determined that the material was stable throughout the study. The physical characteristics of each preparation were an opaque fluid suspension at 1.0%, a viscous foamy suspension at 14.0%, and a cream at 36.0%. Aqueous suspensions of SCI were applied dermally to the clipped dorsal surface of male and female rats (10 each sex per dose) daily for 28 consecutive days. An area of 32 cm^2 was treated until test animals achieved a body weight of 350 grams, after which the treated area was increased to 36 cm^2, and at approximately 400 grams to 40 cm^2. All doses were applied using a 5.0 mL plastic disposable syringe. The treated area was covered with a 2-inch wide, porous gauze wrapped several times around the animal and secured with elastic tape to prevent ingestion of the test article. The treated area remained covered for six hours, after which the gauze wrap was removed. Test animals were then held under warm water to rinse the excess test article and dried with paper towels. The animals were provided with Purina ground certified diet (No. 5002) and water ***ad libitum***. Parameters of response included daily gross observation of local irritancy, weekly body weight and food consumption, hematologic and clinical biochemical test parameters, absolute and relative organ weights, gross and microscopic pathology.
Year Conducted: 1990-1991 **GLP:** yes
Test substance: Sodium cocoyl isethionate (SCI), Batch No. 1247; thin, white-colored, waxy flakes; 72.4% activity.
Result: Gross observation of the test animals during the study failed to reveal any signs of systemic toxicity attributable to treatment with the test material. One male animal in the mid-dose group died during the test but the death was not related to dosing. No male animals in the control, low and mid dose groups exhibited dermal irritancy. Two males in the high dose exhibited very slight erythema during the third and fourth week of the study, but this was not statistically significantly different from the controls. Local irritancy was observed for females in all dose groups for the first week of study only. Thereafter, both the incidence and severity of the responses decreased during the remainder of the study. There was a significant decrease in body weight gain for the high dose males during the second and third week of the study, but not at the conclusion of the study. No significant effects on female body weight gain or food consumption

for both sexes was observed. There was a significant decrease in average hemoglobin level for males in the mid dose group. However, the average hemoglobin data for the high dose group was within historical control ranges. None of the males or females showed any effects considered to be treatment related on other hematologic parameters. Similarly, there was a significant decrease in serum glucose in high dose males, but no other biochemical or histopathology effects were noted for males or females. There was a statistical increase in relative heart weight for males and relative adrenal weight for females in the high dose group, though these were within historical control ranges for this strain of rat. No abnormal gross or microscopic pathology was observed.

Remark: Environmental conditions were maintained within the ranges of 65-78°F for temperature, 40-70% for relative humidity, and a light cycle of 12 hours on and 12 hours off. Overall, results indicate that under the conditions of the 28-day dermal application study, daily topical doses of SCI as high as 2.07 g/kg was without significant toxic effect in the rat. The NOAEL was 2.07 g/kg bw/d. The results of the 28-day dermal study are considered to be important in indicating a lack of potential human systemic toxicity via this route as consumer exposure to SCI-containing products is by the dermal route.

Source: Grieco, R. 1991. Twenty-eight day dermal application study on sodium cocoyl isethionate. Unilever Research U.S. Inc., New Jersey, Study No. 7782.

Reliability: (1) valid without restriction. Well documented GLP study.

(c)

Species: rat
Sex: Male/Female
Strain: Sprague Dawley, 5-6 weeks old
Route of admin.: Oral (Feeding)
Exposure period: 14 days
Frequency of treatment: *Ad libitum* in diet
Doses: 1.0%, 3.0%, 5.0% (w/w)
Control Group: yes
NOAEL: 1.0%
LOAEL: >1.0%
Method: Groups of four male and four female rats were fed either 1.0%, 3.0% or 5.0% (w/w) Jordapon CI in purified diet for 14 days in order to determine the appropriate dose levels for 28 day feeding study (see 5.4(d)). A control group of four male and four female rats were fed the purified diet alone. The diets were prepared weekly. Initial body weight ranges were 184.6-202.3 g (males) and 147.9-165.5 g (females). The animals were observed up to two times per day for signs of ill health or reaction to treatment. Body weights were recorded at twice-weekly intervals, food and water intakes were measured twice weekly, and weekly consumptions were calculated. At the end of the study all rats were sacrificed. No necropsy was done.
Year Conducted: 1994 **GLP:** yes
Test substance: Jordapon CI (Sodium cocoyl isethionate, 90%), Sample No. S2052501.
Result: No animals died during the 14 day study and no treatment-related clinical signs were observed. No statistical analysis of body weight or food consumption changes was done due to insufficient data, but some reduction in food intake in the 5% dose group and body weight gains was evidenced in the 3.0% and 5.0% dose groups. These slight reductions were taken as evidence of palatability

issues and therefore the maximum level of Jordapon Ci recommended for the 28 day feeding study is 1% in purified diet (see 5.4(d)).

Source: Lea, L. 1994. Jordapon CI: 14 day palatability study in rats. Unilever Research U.S. Inc., Bedford, England, Study No. FF940214.

Reliability: (1) valid without restriction. Well documented GLP study.

(d)

Species: rat
Sex: Male/Female
Strain: Sprague Dawley, 5-6 weeks old
Route of admin.: Oral (Feeding)
Exposure period: 28 days
Frequency of treatment: *Ad libitum* in diet
Doses: 0.1%, 0.3%, 1.0% (w/w)
Control Group: yes
NOAEL: 1.0%
LOAEL: >1.0%
Method: Three groups of ten male and ten female rats were fed 0.1%, 0.3% or 1.0% (w/w) Jordapon CI in purified diet for 28 days. A control group of ten male and ten female rats were fed the purified diet alone. The diets were prepared weekly based on the ESL modified AIN-76A (MODAIN) diet, with the Jordapon CI added in place of the starch component. Initial body weight ranges were 174.7-198.4 g (males) and 137.9-157.1 g (females). The animals were observed up to two times per day for signs of ill health or reaction to treatment. Body weights were recorded at weekly intervals, food and water intakes were measured twice weekly, and the weekly consumptions calculated. At the end of the study all rats were sacrificed and given a detailed necropsy, including weights and histology of a number of organs and tissues. Prior to necropsy, blood samples were taken by cardiac puncture for clinical pathology determinations.
Year Conducted: 1994 **GLP:** yes
Test substance: Jordapon CI (Sodium cocoyl isethionate, 90%), Sample No. S2052501.
Result: Analytical results indicate that the measured concentration in the diet was within 10% of the nominal concentration in all cases. Body weight gain of all male rats was increased in all treatment groups during the first week of the study. Body weight gains of female rats fed 0.3% and 1.0% were decreased during the second week of the study only. No further changes were observed. Food and water consumption decreased slightly in female rats but not in male rats. Plasma creatinine was decreased slightly in male rats fed 0.3% and 1.0%. Relative kidney weight was increased slightly in female rats fed 1.0%. No macroscopic or histological effects were observed.
Remark: The results indicate that daily dietary administration of Jordapon CI to rats for 28 days had no significant toxicological effect related to treatment. The top dose in this feeding study was equivalent to approximately 1000 mg/kg bw/day, which is identified as the NOAEL. This study was supported by test article characterization study #AC940212, which confirmed that the test substance was sodium cocoyl isethionate of approximately 90% purity. Impurities were 5.45% free fatty acid, a small amount of sodium isethionate, and some unidentified volatile impurities. Supporting study #AH940213 showed that the test material was homogeneously dispersed in the diet concentrations of 0.1, 0.3 and 1.0% and the same concentrations were found to be stable in the diet formulation for 14 days. The achieved concentrations of the

test item in the actual diet prepared were found to be within ±10% of the nominal concentration.

Source: Lea, L. 1995. Jordapon CI: 28 day feeding study in rats. Unilever Research U.S. Inc., Bedford, England, Study No. FF940215.

Reliability: (1) valid without restriction. Well documented GLP study.

5.5 Genetic Toxicity 'in Vitro'

(a)

Type: Bacterial reverse mutation assay (Ames test)

System of testing: *Salmonella typhimurium* TA 98, TA100, TA 1535, and TA 1537

Concentration: 4 to 5000 µg/plate

Metabolic activation: with and without S-9

Result: negative

Method: The first experiment was performed with strains TA 98, TA 100, TA 1535, and TA 1537 using three plates per dose in order to determine the appropriate dose range. A reduced rate of spontaneously occurring colonies as well as visible thinning of the bacterial lawn were used as indicators of toxicity. In the second experiment, 0.1 mL of the different dilutions of the test material (4, 20, 100, 500, 2500 and 5000 µg/plate) were thoroughly mixed with 0.1 mL of 10^{-6} dilution of the overnight culture of TA 100 and plated with histidine and biotin rich top agar (3 plates per dose). The solvent control is compared to the number of colonies per plate in the presence of the test compound. Results are given as a ratio of these values (i.e., surviving fraction).

For the mutagenicity test, top agar is prepared for the *Salmonella* strains by mixing 100 mL agar with 10 mL of a 0.5 mM histidine-biotin solution. The following are added in order to 2 mL of molten top agar at approximately 45°C: 0.1 mL of nutrient broth culture of the bacterial tester strain, 0.1 mL of the test compound solution, and 0.5 mL of the S-9 mix (if required) or buffer. After mixing, the liquid is poured into a Petri dish with minimal agar. After incubation for approximately 48 hours at 37°C in the dark, colonies (his+ revertants) are counted. Both positive and negative control plates are also tested with each strain.

Year Conducted: 1994 **GLP:** yes

Test substance: Hostapon SCID (Batch 1, October 1993), consisting mainly of sodium coconut isethionate (66% by weight) with lower levels of stearic acid (19 ± 2%), coco fatty acids (7 ± 2%) and sodium isethionate (max 4%). Purity, 68.7% SCI and 25.0% free fatty acid; white flakes.

Remark: Visible precipitation of the test material on the plates was observed at 100 µg/plate and above.

Result: The test material was toxic to most of the bacterial strains at doses of 500 or 2500 µg/plate and above. Thinning of the bacterial lawn and a reduction in the number of colonies was observed at these doses. The test material did not result in a significant increase in the number of revertant colonies with any of the tester strains either in the presence or absence of S-9 activation. The test was performed in two independent experiments with the same results. The test material is not mutagenic in these bacterial systems at the dose levels tested.

Source: Müller, W. 1994. Hostapon SCID: Study of the mutagenic potential in strains of *Salmonella typhimurium* (Ames Test). Hoechst Aktiengesellschaft, Report No. 94.0088, Project No. 93.0742. (English translation)
Reliability: (1) valid without restriction. Well documented GLP report.

(b)
Type: Bacterial reverse mutation assay (Ames test)
System of testing: *Salmonella typhimurium* TA 98, TA100, TA 1535, TA 1537 and TA 1538
Concentration: 1 to 1000 µg/plate
Metabolic activation: with and without S-9
Result: negative
Method: The assay was performed in two phases. The first phase was used to establish the appropriate dose range. Ten dose levels of the test material were plated (10 to 10,000 µg/plate), one plate per dose, with an overnight culture of TA 100 on selective minimal agar in both the presence and absence of microsomal enzymes. The second phase is the initial mutagenicity assay and the confirmatory mutagenicity assay. The test material was tested at five dose levels along with the appropriate vehicle and positive controls on tester strains TA 98, TA100, TA 1535, TA 1537 and TA 1538 in the presence and absence of S-9 mix. All dose levels and controls were plated in triplicate. The dose levels reported are actual measured concentrations, adjusted for purity. Each plate was labeled with a code system that identified the test material, test phase, dose level, tester strain, and activation. Following the preincubation, 2.0 mL of selective top agar was added to each culture tube and the mixture was vortexed and overlaid onto the surface of 25 mL of minimal bottom agar. After solification, the plates were inverted and incubated for 48 hours at 37 ± 2°C. Colonies were counted either entirely by automated colony counter or entirely by hand. The condition of the bacterial lawn was evaluated for evidence of toxicity; any observed was scored relative to the vehicle control plate. For all replicate platings, the mean number of revertants per plate was calculated.
Year Conducted: 1990-1991 **GLP:** yes
Test substance: LB-7819-1, identified as sodium cocoyl isethionate; Purity, 72.45%; white waxy flakes.
Remark: The results of the first phase (range finding) assay indicate that because of toxicity to the test system, the appropriate maximum dose to be plated in the initial mutagenicity assay would be 1000 and 100 µg/plate in the presence and absence of microsomal enzymes, respectively.
Result: No positive responses were observed in any of the tester strains in the presence or absence of microsomal enzymes. All criteria for a valid study were met. The test material is not mutagenic in these bacterial systems at the dose levels tested.
Source: Hillgardner, J. and Fung, W.-P. 1991a. *Salmonella typhimurium* preincubation reverse mutation assay with confirmation on LB-7819-1 (sodium cocoyl isethionate). Microbiological Associates Inc., Study No. LB-7819.
Reliability: (1) valid without restriction. Well documented GLP report.

(c)

Type: Mammalian cell gene mutation assay

System of testing: Chinese hamster ovary (CHO) cells

Concentration: up to 300 ug/mL

Metabolic activation: with and without

Result: negative

Method: The assay was conducted both in the presence and absence of an Arochlor-induced S-9 activation system at doses of 19, 38, 75, 150 and 300 ug/mL. At the time of use, the test material was pulverized into a fine powder with a sterile mortar and pestle and then diluted in the appropriate volume of distilled/deionized water. All test substance dosing solutions were prepared on an active ingredient basis (i.e., adjusted for purity). A toxicity test was performed to determine the dose levels for the chromosome aberration assay and consisted of test material effect on mitotic indices and cell cycle delay. CHO cells were seeded for each treatment condition at approximately 5 x 10^5 cells/25m^2 flask and incubated at 37±1°C for 16-24 hours. Cells were then treated for six (non-activated) or two (activated) hours, washed with PBS, and returned to the incubator for 24 hours. For the chromosome aberration assay, CHO cells were seeded similarly to the toxicity test. The cells were then treated for 8 or 14 (non-activated) or two (activated) hours, washed with PBS, refed with complete medium containing 0.1 ug/mL Colcemid and reincubated. Metaphase CHO cells were collected for microscopic evaluation at 10 hours after initiation of treatment for both the non-activated and S-9 activated studies. Due to an observed delay in cell cycle kinetics at dose levels 150 and 300 ug/mL, metaphase cells at these test concentrations were collected 16 (non-activated) and 19 (activated) hours after initiation of treatment in order to assure the evaluation of the first-division metaphase cells. The four highest test concentrations with analyzable metaphase cells were evaluated for chromosomal aberrations.

Year Conducted: 1991 **GLP:** yes

Test substance: LB-7818-1, identified as sodium cocoyl isethionate; Purity, 72.45%; white waxy flakes.

Remark: Results of the toxicity study with nine concentrations of the test material ranging from 0.5 to 5100 ug/mL indicated that dose levels of 19, 38, 75, 150 and 200 ug/mL were appropriate for the study. In the absence of activation, the test article was soluble in solvent and treatment medium at all concentrations tested. Slight toxicity was observed at the 10-hour harvest at dose level 150 ug/mL and excessive toxicity was observed at dose level 300 ug/mL. In the presence of S-9 activation, the test material was again solvent at all dose levels. Slight toxicity was observed at dose level 38 ug/mL, moderate toxicity at 75 ug/mL, and excessive toxicity at 150 and 300 ug/mL. Because of toxicity, no metaphase cells were available for evaluation of chromosomal aberrations at the 300 ug/mL dose level. No statistically significant increase in chromosome aberrations was observed in either the non-activated or S-9 activated test system. The result is therefore negative in the CHO cytogenetics assay.

Source: Hillgardner, J. and Fung, W.-J. 1991b. In vitro chromosomal aberration assay on LB-7818-1 (sodium cocoyl isethionate) in Chinese hamster ovary (CHO) cells. Microbiological Associates Inc., Study No. L B-7818.

Reliability: (1) valid without restriction. Well documented GLP report.

5.6 Genetic Toxicity 'in Vivo'

Remark: Not required. *In vitro* studies did not reveal any indication of mutagenicity.

5.7 Carcinogenicity

Result: Not an HPV endpoint. Data from the genotoxicity studies (section 5.5) do not suggest any carcinogenicity concern.

5.8 Toxicity to Reproduction

Remarks: Specific studies addressing the reproductive and developmental toxicity endpoints were not available, however, from the 28 day repeated dose feeding study in section 5.4 (Lea 1995), the data provide reassurance of the lack of potential effects on fertility up to 1000 mg/kg bw/day. In that study, the sex organs were weighed, retained and examined histologically from both sexes. There were no significant changes in the weight or macroscopic or microscopic appearance of these sex organs of either sex. Furthermore, the testes were feixed initially in Bouin's solution, which results in higher quality sections of this tissue than if formalin were used.

5.9 Developmental Toxicity/Teratogenicity

Remark: Specific studies addressing the reproductive and developmental toxicity endpoints were not available, however, from the 28 day repeated dose feeding study in section 5.4 (Lea 1995), the data provide reassurance of the lack of potential effects on fertility up to 1000 mg/kg bw/day. In that study, the sex organs were weighed, retained and examined histologically from both sexes. There were no significant changes in the weight or macroscopic or microscopic appearance of these sex organs of either sex. Furthermore, the testes were feixed initially in Bouin's solution, which results in higher quality sections of this tissue than if formalin were used.

5.10 Other Relevant Information

Remark: Work on the absorption through skin of a related compound, sodium dodecoyl isethionate (SDI) (also reported as sodium lauryl isethionate [SLI]), has been carried out in a series of *in vitro* and *in vivo* studies.

In vitro penetration through rat skin: Excised 2.5 cm diameter sections of skin from female Colworth-Wistar rats were exposed to [^{14}C]SDI. An amount of 0.25 mL of 0.25 mM aqueous [^{14}C]SDI solution was pipetted onto the epidermal surface of the skin and 10.0 mL of saline was added to the sampling compartment against the dermis. After 24 hours the epidermal surface was washed with an excess of distilled water monitored for ^{14}C. Results showed no detectable

(<0.1 µg/cm^2) penetration of SDI 24 hours after application, although around 30% of the applied SDI remained on the skin after rinsing. It is possible that something in the experimental design may have contributed to the lack of detection of SDI in the receptor solution, and the authors indicate the study should be considered inconclusive.

In vitro penetration through human skin: Epidermal samples from female abdominal skin obtained at autopsy and mounted in 1 cm diameter penetration cells, were exposed to 0.1 mL of 0.25 mM aqueous [^{14}C]SDI solution. Penetration was 0.4 ± 1.7 µg/cm^2 at 2 hours and increased steadily up to 30.1 ± 13.6 µg/cm^2 at 48 hours. About 30-50% of the SDI was retained on the skin following rinsing. The material remaining in the skin would have been bioavailable as indicated by the increasing rate of absorption over the 48 hours.

In vivo rat penetration studies: In one experiment, [^{14}C]SDI was applied (0.5 mL) as 25 mM aqueous solution over 10 cm^2 of rat skin for 15 minutes. The expired CO_2, urine, faeces and the carcasses of the animals after excision of the treated skin was monitored for ^{14}C at 24 hours after treatment. The excised skin was monitored for ^{14}C and examined by autoradiography. At 24 hours, levels of parent/metabolites in excreta were below the limits of detection. The level of ^{14}C in the expired CO_2 was very low and from these levels the amounts penetrating were shown to be <0.3 but >0.1 µg/cm^2. In a second *in vivo* experiment, rats were exposed to the same dose of SLI for 12 hours. The penetration rate reached a plateau of 0.6 µg/cm^2 after 3 hours, which continued until the end of the experiment.

Based on these studies it can be seen that SDI/SLI can be absorbed through the skin at a low to moderate rate.

Sources: a) Howes, D. 1975. The percutaneous absorption of some anionic surfactants. J. Soc. Cosmet. Chem. 26:47-63.
b) Howes, D. and Cordell, A.J. 1974. Correlation between surfactant properties and irritancy to skin. Part 3. Percutaneous absorption of sodium lauroyl isenthionate (Igepon A), sodium lauryl sulphate, and sodium P-1-dodecyl benzene sulphonate. March 11, 1974. Unilever Research Report PCW 74 1191

Reliability: (2) Valid with restrictions.

5.11 Experience with Human Exposure

(a)

Type: Modified soap chamber test
Concentration: 8%
Exposure Time: 5 days
Number of Panelists: 15 completed the study
Result: minimally irritating
Method: The panelists consisted of healthy men and women over 18 years of age. The study was performed as a modification of the procedure described in Frosh and Kligman (The Soap Chamber Test, Journal of the American Academy of Dermatology 1:35-41, 1979). Webril discs (occlusive patches consisting of 12 mm diameter aluminum chambers snuggly fitted with a layer of non-woven cotton cloth) were affixed by 2" x 4" pieces of non-occlusive tape. The Webril discs were moistened with approximately 0.2 mL of test solution and applied

to each panelists' forearm. Up to five chambers were applied to each arm of each panelist. The initial patch remained on for a 24-hour period, with the patches applied over the next 4 days of the five day remaining on for 6-hour periods. Patches were removed 30 minutes before scoring for erythema using a scale from 0-5.

Year conducted: 1985 **GLP:** no

Test substance: An 8% solution of sodium cocoyl isethionate.

Remark: Results are shown in the table.

Panelist	Erythema Scores
1	2.6
2	2.2
3	1.4
4	1.2
5	0.0
6	3.2
7	2.4
8	4.4
9	1.2
11	2.2
12	2.2
13	2.6
14	2.4
15	1.6
16	0.0
Mean	1.9733
Min/Max	0.0/4.4

Source: CTFA. 1985. Chamber Irritation Test. Study No. 83035-CI.

Reliability: (2) valid with restrictions. Some details of study not reported.

(b)

Type: Modified soap chamber test

Concentration: 8%

Exposure Time: 5 days

Number of Panelists: 14 completed the study

Result: minimally irritating

Method: The panelists consisted of healthy men and women over 18 years of age. The study was performed as a modification of the procedure described in Frosh and Kligman (The Soap Chamber Test, Journal of the American Academy of Dermatology 1:35-41, 1979). Webril discs (occlusive patches consisting of 12 mm diameter aluminum chambers snuggly fitted with a layer of non-woven cotton cloth) were affixed by 2" x 4" pieces of non-occlusive tape. The Webril discs were moistened with approximately 0.2 mL of test solution and applied to each panelists' forearm. The test solution was applied to three sites on the right forearm and one site on the left forearm of each panelist. The initial patch remained on for a 24-hour period, with the patches applied over the next 4 days of the five day remaining on for 6-hour periods. Patches were removed 30 minutes before scoring for erythema using a scale from 0-5.

Year conducted: 1985 **GLP:** no

Test substance: An 8% solution of sodium cocoyl isethionate (81% active, with 15% coco fatty acid)

Remark: Mean erythema scores for the sites on the right forearm were 0.529, 0.486, and 0.686. The mean erythema score for the site on the left arm was 1.014. Individual minimum and maximum scores

for any site were 0.0 and 4.0, respectively.
Source: CTFA. 1986. Chamber Irritation Test. Study No. 86016-CI.
Reliability: (2) valid with restrictions. Some details of study not reported.

(c)
Type: Modified soap chamber test
Concentration: 8%
Exposure Time: 5 days
Number of Panelists: 15 completed the study
Result: minimally irritating
Method: The panelists consisted of healthy men and women over 18 years of age. The study was performed as a modification of the procedure described in Frosh and Kligman (The Soap Chamber Test, Journal of the American Academy of Dermatology 1:35-41, 1979). Webril discs (occlusive patches consisting of 12 mm diameter aluminum chambers snuggly fitted with a layer of non-woven cotton cloth) were affixed by 2" x 4" pieces of non-occlusive tape. The Webril discs were moistened with approximately 0.2 mL of test solution and applied to each panelists' forearm. A maximum of six chambers were applied to the forearm of each panelist. The initial patch remained on for a 24-hour period, with the patches applied over the next 4 days of the five day remaining on for 6-hour periods. Patches were removed 30 minutes before scoring for erythema (redness) using a scale from 0-4, for edema using a scale from 0-3, and for vesicles using a scale from 0-3.
Year conducted: 1985 **GLP:** no
Test substance: An 8% solution of sodium cocoyl isethionate (81% active, with 15% coco fatty acid)
Remark: For erythema, the mean score was 1.36 (0.26 minimum/2.6 maximum). For edema, the mean score was 0.147 (0.0 min/0.6 max). For vesicles, the mean score was 0.12 (0.0 min/0.9 max). The total scores combined are shown in the following table.

Panelist	Total Scores
1	1.6
2	0.2
3	1.6
4	0.8
5	2.2
6	3.2
7	0.2
8	3.6
9	1.2
11	0.2
12	3.2
13	2.2
14	0.6
15	3.0
16	0.6
Mean	1.6267
Min/Max	0.200/3.600

Source: CTFA. 1986. Chamber Irritation Test. Study No. 86111-CI.
Reliability: (2) valid with restrictions. Some details of study not reported.

(d)
Type: Modified soap chamber test
Concentration: 8%
Exposure Time: 5 days
Number of Panelists: 19 completed the study
Result: minimally irritating
Method: The panelists consisted of healthy men and women over 18 years of age. The study was performed as a modification of the procedure described in Frosh and Kligman (The Soap Chamber Test, Journal of the American Academy of Dermatology 1:35-41, 1979). Webril discs (occlusive patches consisting of 12 mm diameter aluminum chambers snuggly fitted with a layer of non-woven cotton cloth) were affixed by 2" x 4" pieces of non-occlusive tape. The Webril discs were moistened with approximately 0.1 mL of test solution and applied to each panelists' forearm. A maximum of seven chambers were applied to the forearm of each panelist. The initial patch remained on for a 24-hour period, with the patches applied over the next 4 days of the five day remaining on for 6-hour periods. Patches were removed 30 minutes before scoring for erythema (redness) using a scale from 0-4, for edema using a scale from 0-3, and for vesicles using a scale from 0-3. In addition, transepidermal water loss (TEWL) was measured using a Servomed Evaporimeter on Day 1 (prior to application) and on days 2 and 5.
Year conducted: 1988 **GLP:** no
Test substance: An 8% solution of sodium cocoyl isethionate (81% active)
Remark: The mean scores were 1.667, 0.344, and 0.258 for erythema, edema, and vesicles, respectively. The total mean irritation score was 2.269. The TEWL mean readings were 9.6 and 8.9 $g/m^2/hr$ on days 2 and 5, respectively.
Source: CTFA. 1988. Chamber Irritation Test. Study No. 88165-CI.
Reliability: (2) valid with restrictions. Some details of study not reported.

(e)
Type: Modified soap chamber test
Concentration: 8%
Exposure Time: 2 days
Number of Panelists: 21 panelists began the study (terminated early)
Result: irritating
Method: The panelists consisted of healthy men and women over 18 years of age. The study was performed as a modification of the procedure described in Frosh and Kligman (The Soap Chamber Test, Journal of the American Academy of Dermatology 1:35-41, 1979). Webril discs (occlusive patches consisting of 12 mm diameter aluminum chambers snuggly fitted with a layer of non-woven cotton cloth) were affixed by 2" x 4" pieces of non-occlusive tape. The Webril discs were moistened with approximately 0.1 mL of test solution and applied to each panelists' forearm. A maximum of seven chambers were applied to the forearm of each panelist. The initial patch remained on for a 24-hour period, with the patches applied over the next 4 days of the five day remaining on for 6-hour periods. Patches were removed 30 minutes before scoring for erythema (redness) using a scale from 0-4, for edema using a scale from 0-3, and for vesicles using a scale from 0-3.
Year conducted: 1988 **GLP:** no
Test substance: An 8% solution of sodium cocoyl isethionate
Remark: It was necessary to discontinue the study for many subjects early in the test due to high levels of irritation, which the study

authors felt may have been aggravated by the cold, dry weather conditions in the Phoenix, Arizona area during the test. Therefore, based on statistical considerations related to the large number of missing scores, only the data from the first two days of the study were analyzed. Using these data, the mean total irritation score was 2.5 ± 1.5.

Source: CTFA. 1988. Chamber Irritation Test. Study No. 88347-CI.

Reliability: (4) Not assignable. The results of this study are difficult to interpret since only the first two days of data were analyzed.

(f)

Type: Modified soap chamber test

Concentration: 8%

Exposure Time: 2 days (28 hours)

Number of Panelists: 17 completed the study

Result: minimally irritating

Method: The panelists consisted of healthy men and women 18-20 years of age. The study was performed as a modification of the procedure described in Frosh and Kligman (The Soap Chamber Test, Journal of the American Academy of Dermatology 1:35-41, 1979). Webril discs (occlusive patches consisting of 12 mm diameter aluminum chambers snuggly fitted with a layer of non-woven cotton cloth) were affixed by 2" x 4" pieces of non-occlusive tape. The Webril discs were moistened with approximately 0.1 mL of test solution and applied to each panelists' forearm. A maximum of seven chambers were applied to the forearm of each panelist. The 2-day test began on Tuesday and ended on Wednesday. Patches remained on for a 28-hour period. Patches were removed 30 minutes before scoring for erythema (redness) using a scale from 0-4, for edema using a scale from 0-3, and for vesicles using a scale from 0-3. In addition, transepidermal water loss (TEWL) was measured using a Servomed Evaporimeter on Day 1 (prior to application) and on day 2.

Year conducted: 1990 **GLP:** no

Test substance: An 8% solution of sodium cocoyl isethionate

Remark: The mean scores were 1.235, 0.294, and 0.0 for erythema, edema, and vesicles, respectively. The total mean irritation score was 1.529. While the protocol indicated that TEWL readings were made, none were reported.

Source: CTFA. 1990. Chamber Irritation Test. Study No. 90156-CI.

Reliability: (2) valid with restrictions. Some details of study not reported.

(g)

Type: 48 hour patch test

Concentration: 15%

Exposure Time: 48 hours

Number of Panelists: 12 completed the study (7 male, 5 female)

Result: not irritating

Method: The purpose of the study is to determine whether the test material is capable of eliciting primary irritation when applied to human skin for 48 hours. Approximately 20 µL of the test material was applied with an occlusive patch (1.0 cm x 1.0 cm Webril pads occluded with tape) to the skin of the backs (sub scapular region) of each panelist. The patch is left in place for 48 hours, then removed and the degree of dermal response is graded at 6, 24 and 48 hours for erythema, edema, papules, vesicles, etc.

Year conducted: 1989 **GLP:** no

Test substance: An 4% aqueous solution in a gel cleanser containing 15% sodium

cocoyl isethionate.
Remark: No visible erythema or other effects were observed in the study.
Source: CTFA. 1989. Summary of results of a 3 day irritation study for a gel cleanser containing 15% sodium cocoyl isethionate. Study File No. 1124.
Reliability: (2) valid with restrictions. Some details of study not reported.

(h)
Type: Cumulative irritation skin test
Concentration: 0.10% aqueous solution
Exposure Time: 21 days
Number of Panelists: 35 completed the study (9 male, 26 female)
Result: very mild irritation
Method: The procedure was a modification of the method by Phillips et al. (1972. Toxicology and Applied Pharmacology, 21:369-382), which was based on the the methods described originally by Lanman (Joint Conference on Cosmetic Sciences, April 21-23, 1968). A volume of 0.3 mL of 0.10% sodium cocoyl isethionate in distilled water was pipetted onto Webril pads that were applied to the right and left paraspinal regions on the back of each volunteer subject. Samples of undiluted (low irritation control) and concentrated (high irritated control) solutions were also tested. Patches were removed after 23 hours, the subject allowed to shower, and dermal effects were scored. Once scored, new patches of the same concentrations were applied. This continued every day for 21 consecutive days. The average of all scores (35 subjects, 21 scoring sessions each) was calculated and reported as the group mean score using the following scale:

0.00-0.49	Very mild
0.50-0.99	Mild
1.00-1.49	Slightly irritating
1.50-1.99	Mildly irritating
2.00-2.99	Moderately irritating
3.00-4.00	Severely irritating

Year conducted: 1985 **GLP:** no
Test substance: A 0.10% aqueous solution of sodium cocoyl isethionate
Remark: The group mean score was 0.093, which is very mild irritation. Individual averages ranged from 0.00 to 1.143 The low and high irritation controls had mean scores of 0.063 and 1.616, respectively.
Source: Hill Top Research Inc. 1985. 21-day Cumulative Irritation Patch in Humans for Sodium Cocoyl Isethionate. Hill Top Research Project No. 85-1248-72D.
Reliability: (2) valid with restrictions. Some details of study not reported.

(i)
Type: Repeat application patch test
Concentration: 0.2%, 0.4%, 1.0% as aqueous solutions
Exposure Time: 3 applications of 24 hours each
Number of Panelists: 10 completed the study
Result: very mild irritation
Method: A standard repeat application patch test was conducted using the upper arms of 10 volunteers to evaluate the relative mildness of the test materials on the skin. Occlusive Parke-Davis Readi-Bind clinical patches (40 mm x 40 mm squares of Blenders tape with

20 mm x 20 mm square cotton pads) were used. Each pad was wetted with 0.3 mL of the respective test solutions (0.2, 0.4 and 1.0% w/v). The patches were applied by the test subjects themselves on a Friday, Monday and Wednesday sequence for a 24-hour duration for each application. At 24 hours after the patches were removed, the subjects washed the sites, and then at 72 hours after initial application they reported to the laboratory for grading of dermal irritation using the standard 0-4 grading scale (see table in (h) above, and to have new patches applied. This second application patch was removed after 24 hours and rinsed. At 120 hours, the test areas were scored and new patches were applied a third time. After another 24 hours, these final patches were removed and the area rinsed, followed 24 hours later by the final grading. Any test site which attained a grade of 2 or higher was not repatched. The actual grade observed at each subsequent grading session or the grade attained when patching was discontinued (whichever was higher) was recorded and used in the statistical analysis.

Year conducted: 1983 **GLP:** no

Test substance: 0.2%, 0.4%, and 1.0% aqueous solutions of sodium cocoyl isethionate (83% purity, with the rest being 0.8% NaCl, 0.25% $NaSO_4$, 1-2% moisture, and 10.0% free fatty matter); white powder

Remark: The results are shown in the following table:

Solution Concentration	Daily Averages			Grade Range	Average Grade
	1st Appl.	2nd Appl.	3rd Appl.		
0.2%	0.21	0.25	0.45	0.0-2.0	0.30
0.4%	0.0	0.25	0.35	0.0-1.0	0.20
1.0%	0.04	0.40	0.35	0.0-1.5	0.26

Source: CTFA. 1984. Repeat application patch test. Lab Request No. 366. April 4, 1984.

Reliability: (2) valid with restrictions. Some details of study not reported.

(j)

Type: Human Repeated Insult Patch Tests (HRIPTs)

Concentration: 49.87% in personal washing bars

Exposure Time: not reported

Number of Panelists: 191 to 199 (for four studies)

Result: not sensitizing

Method: Four standard HRIPTs with 9 induction patches and challenge have been performed on personal washing bars that contain sodium cocoyl isethionate. Three tests included an open exposure at anticipated use concentrations. For open exposures solutions were applied to the arm each time patches were applied to the back. In each study four variant bars, all containing sodium cocoyl isethionate at 49.87%, were tested on the same subjects, yielding a total dose to areas served by the same draining lymph nodes of four times the patch concentration.

Year conducted: not reported in summary **GLP:** no

Test substance: personal washing bars containing 49.87% sodium cocoyl isethionate

Remark: No evidence of sensitization to any of the materials tested was observed.

Source: CTFA. 1990. Summary of Human Studies on Sodium Cocoyl Isethionate. (2 pp.).

Reliability: (4) Not assignable. Original studies not available for review.

(k)

Type: 9 Repeated Insult Patch Test (RIPT)
Concentration: 17% in skin cleanser
Exposure Time: nine 24 hour exposures
Number of Panelists: 106 (17 male, 89 female) (96 of 106 completed the study)
Result: not sensitizing or an irritant
Method: A 9 repeated insult patch test was conducted. In the induction phase, approximately 0.2 g of the test material was placed onto a 2 cm x 2 cm square of Webril cotton fabric affixed to semi-occlusive surgical tape and then applied to the back of each test subject between the scapulae and waist, adjacent to the spinal mid-line. Subjects removed the patch 24 hours after application. After another 24 hours (48 hours for removals that occurred on Saturdays), the dermal impact was scored by a trained examiner. This procedure was repeated every Monday, Wednesday, and Friday until nine applications of the test material had been accomplished. If a score of 2 or more for erythema was observed, the patch was moved to a previously unpatched site. If a second observation of a score of 2 or more was made, then no further applications would be made. After the ninth application, there was a rest period of 10 to 21 days without treatment. After this period, a Challenge patch was applied to a previously unpatched site and then scored 24 to 48 hours after application. Scores were based on the standard 0-4 scale for erythema and any edema was noted and described as mild, moderate or severe if present.
Year conducted: 1989 **GLP:** yes
Test substance: Skin cleanser containing 17% sodium cocoyl isethionate; white pearlescent cream.
Remark: Of the 96 participants that finished the study, only one discontinued because of intolerance of the test procedure (the rest all discontinued for personal reasons). For 12 of the 96, there were scattered, transient, barely perceptible to mild non-specific patch test responses, none of which were considered to be irritant or allergic in nature. Two of the 96 subjects experienced delayed mild to moderate erythematous reactions during the challenge phase of the study. Follow up testing done with these two subjects resulted in only mild or no reactions. The skin cleanser containing 17% sodium cocoyl isethionate did not induce clinically meaningful irritation potential in human subjects, nor did it induce allergic contact dermatitis.
Source: Essex Testing Clinic Inc. 1989. Clinical safety evaluation of S.C. 2691-69 skin cleanser: Repeated insult patch test.
Reliability: (2) Valid with restrictions. Well conducted GLP type study.

(l)

Type: 9 Repeated Insult Patch Test (RIPT)
Concentration: 2% w/v aqueous solution
Exposure Time: nine 48 hour exposures
Number of Panelists: 203 completed the study
Result: not sensitizing or an irritant
Method: A 9 repeated insult patch test was conducted, based on the method described by Marzulli and Maibach (Food and Cosmetics Toxicology 12:219, 1974). In the induction phase, an appropriate amount of the test material was placed onto a non-woven fabric Micropad and applied to the intact skin of the upper back in a paraspinal position. The patches were anchored in place with semi-occlusive, hypoallergenic tape and a strip of Blemderm was placed over the

anchor tape to provide a full occlusive barrier. The patches were allowed to remain in contact with the skin for 48 hours, after which they were removed and the sites observed for any reactions. This procedure was repeated until nine applications had been made. All applications during this induction phase were made to the same skin test site unless a grade of 3 was reached, at which time the patch was placed elsewhere. If a grade of 4 or greater was reached, no further applications were made. After the ninth application, there was a rest period of 14 days without treatment. After this period, a Challenge patch was applied to a previously unpatched site and then graded 48 hours after application and then again 24 hours later. Scores were based on a 0-5 scale of reaction that included observations of erythema, induration, vesicles, and bullae.
Hypo- and hyper-pigmentation were also noted if observed.

Year conducted: 1987 **GLP:** no
Test substance: 47.5% sodium cocoyl isethionate in a syndet soap
Remark: Nineteen of the 203 participants showed some reaction in the challenge phase. These 19 were re-challenged and scored. Of these, 6 showed reactions to the re-challenge and were challenged a third time, which occurred about 1 month after the original challenge application. The authors concluded that the irritation and sensitization potential of the test material is "very low if existent at all."
Source: Concordia Research Laboratories Inc. 1987. Human Repeat Insult Patch Test: Ten Test Formulations. Study No. 771.
Reliability: (2) Valid with restrictions. Well conducted study.

(m)
Type: 9 Repeated Insult Patch Test (RIPT)
Concentration: not reported whether applied neat or in solution
Exposure Time: nine 48 hour exposures
Number of Panelists: 158, of which 148 completed the study
Result: not sensitizing
Method: A 9 repeated insult patch test was conducted. In the induction phase, the test material was applied to same site on the scapular back under occlusive patches at the rate of three times weekly (48-hour periods during the week and a 72-hour period on the weekend) for nine applications. Following a 14 day rest period without treatment, two consecutive challenge patches (48 hour periods) of the test material were applied to a different site on the scapular back under occlusive patches. Scores were based on a standard 0-4 scale of reaction that included observations of erythema, infiltration, vesicles, and erosions.

Year conducted: 1985 **GLP:** yes
Test substance: 15% sodium cocoyl isethionate in a gel cleanser; white cream.
Remark: Results indicate some faint erythema and other mild effects in most of the participants. The authors concluded that the test material produced "no allergic responses."
Source: CTFA. 1985. Irritation/sensitization potential of 665.05 white cream using the Jordan-King modification of the Draize Shelanski procedure. Project No. 85-0320-75.
Reliability: (2) Valid with restrictions. Report states that conducted under GLPs, but some details not provided.

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7.1 Risk Assessment

Memo: See sodium cocoyl isethionate assessment plan.