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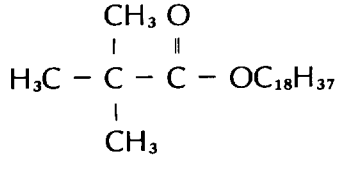
Final Report on the Safety Assessment of Isostearyl Neopentanoate

Isostearyl Neopentanoate, the ester of Isostearyl Alcohol and Neopentanoic Acid, is used in cosmetic products as an emollient at concentrations up to 50 percent. The undiluted ingredient at doses up to 4 ml/kg was shown to be relatively non-toxic in short- and long-term feeding studies. Test data from animal and clinical studies indicate the undiluted ingredient is neither an irritant nor a sensitizer. A cosmetic formulation containing 16 percent Isostearyl Neopentanoate produced no phototoxicity and no photoallergenicity. Mutagenicity, carcinogenicity, and teratogenicity data were not available. Isostearyl Neopentanoate was not considered to be a significant comedogenic agent. On the basis of available data, it is concluded that this ingredient is safe as a cosmetic ingredient in its present practices of use.

CHEMISTRY

Isostearyl Neopentanoate (CAS No. 58958-60-4) is the ester of isostearyl alcohol and neopentanoic acid. It conforms to the formula:



This cosmetic ingredient is also known as Ceraphyl 375; Cyclochem INEO; Schercemol 85; and 2,2-dimethylpropanoic acid, isooctadecyl ester.[1,2] It is prepared by esterifying isostearyl alcohol with neopentanoic acid in the presence of a catalyst; the resulting product is purified by a proprietary process.[2] Reported impurities for Isostearyl Neopentanoate include neopentanoic acid (0.4 percent maximum) and isomers of isostearyl alcohol.[3-5] The chemical and physical properties of Isostearyl Neopentanoate are listed in Table 1.

TABLE 1. Chemical and Physical Properties of Isotearyl Neopentanoate as Used in Cosmetics[2,5,6,10]

Appearance	Clear, slightly yellow liquid
Molecular weight range	348–390
UV absorption	Peak absorbance in isopropyl alcohol solvent occurs at approx. 270 nm
Acid value (mg KOH/g)	2.0 maximum
Saponification value (mg KOH/g)	144–161
Refractive index (at 25°C)	1.4485–1.4515
Pounds per gallon (at 25°C)	7.2
Cloud point	−10.0°C
Iodine value	8.0
Flash point (open cup)	>180°C
Free fatty acid as Neopentanoic Acid (mol. wt. 102)	0.4 percent maximum
Specific gravity (at 25°C)	0.858–0.870
Solubilities (at 5 percent):	
Isopropyl myristate	Soluble
Oleyl alcohol	Soluble
Peanut oil	Soluble
Mineral oil	Soluble
95 percent ethanol	Soluble
Propylene glycol	Soluble
Polypropylene glycol 3025	Insoluble
Polyethylene glycol 400	Insoluble
80 percent ethanol	Insoluble
70 percent sorbitol	Insoluble
Water	Insoluble

COSMETIC USE

Isostearyl Neopentanoate is used in cosmetics for its emollient properties. It functions as a pigment-dispersing agent in eye makeup preparations and as a binder for pressed powder makeup.[6]

Product formulation data submitted to the Food and Drug Administration (FDA) in 1981 by cosmetic firms participating in the voluntary cosmetic registration program indicated that Isostearyl Neopentanoate was used that year in a total of 208 cosmetic formulations (Table 2). The product type in which Isostearyl Neopentanoate was most frequently used was eye shadow (135 products). Reported concentrations of this ingredient in cosmetics were as follows: > 25 to 50 percent (4 products), > 10 to 25 percent (12 products), > 5 to 10 percent (119 products), > 1 to 5 percent (71 products), and > 0.1 to 1 percent (2 products).[7,8]

Voluntary filing of product formulation data with the FDA by cosmetic manufacturers and formulators conforms to the prescribed format of preset concentration ranges and product categories as described in Title 21, Part 720.4 of the Code of Federal Regulations.[9] Because data are only submitted within the framework of preset concentration ranges, opportunity exists for overestimation

TABLE 2. Product Formulation Data[7,8]

Product Category	Total No. of Formulations in Category	Total No. Containing Ingredient	No. of Product Formulations Within Each Concentration Range (percent)*				
			>25–50	>10–25	>5–10	>1–5	>0.1–1
Isostearyl Neopentanoate							
Eyeliner	396	5	–	–	5	–	–
Eye shadow	2582	135	–	–	98	37	–
Eye makeup remover	81	1	–	1	–	–	–
Other eye makeup preparations	230	3	–	–	2	1	–
Blushers (all types)	819	20	2	3	8	7	–
Makeup foundations	740	10	–	–	2	8	–
Makeup bases	831	16	2	7	–	7	–
Rouges	211	2	–	–	–	2	–
Other makeup preparations (not eye)	530	1	–	1	–	–	–
Skin cleansing preparations (cold creams, lotions, liquids, and pads)	680	1	–	–	1	–	–
Face, body, and hand skin care preparations (excluding shaving preparations)	832	1	–	–	–	1	–
Moisturizing skin care preparations	747	8	–	–	3	4	1
Night skin care preparations	219	1	–	–	–	1	–
Other skin care preparations	349	1	–	–	–	1	–
Suntan gels, creams, and liquids	164	2	–	–	–	2	–
Other suntan preparations	28	1	–	–	–	–	1
1981 TOTALS		208	4	12	119	71	2

*Preset product categories and concentration ranges in accordance with federal filing regulations (21 CFR 720.4).

of the actual concentration of an ingredient in a particular product. An entry at the lowest end of a concentration range is considered the same as one entered at the highest end of that range, thus introducing the possibility of a two- to ten-fold error in the assumed ingredient concentration.

Cosmetic products containing Isostearyl Neopentanoate are applied to or have the potential to come in contact with eyes and skin. Frequency and duration of application of these products will vary. Formulations incorporating Isostearyl Neopentanoate as an ingredient may be used as infrequently as once a week to as frequently as several times a day. Many of these products may be expected to remain in contact with the skin for as briefly as a few hours to as long as a few days. Each cosmetic product containing Isostearyl Neopentanoate has the potential for repeated application over the course of several years.

A cosmetic makeup cream containing Isostearyl Neopentanoate as a component ingredient has been described in a French patent.[11] This was the only reference to Isostearyl Neopentanoate in the published literature of which the Panel was aware.

ANIMAL TOXICOLOGY

Acute Oral Toxicity

The acute oral toxicity of cosmetic products containing various concentrations of Isostearyl Neopentanoate was assessed in both rats and mice (Table 3). In a study to evaluate 100 percent Isostearyl Neopentanoate, the acute oral LD_{50} in rats was > 40 ml/kg.[12]

Skin Irritation

One hundred percent Isostearyl Neopentanoate caused no skin irritation in 24-hour patch tests with rabbits.[13-15] Cosmetic formulations containing various concentrations of Isostearyl Neopentanoate produced skin reactions in rabbits ranging from no skin irritation to minimal or mild skin irritation (Table 4).

Skin Sensitization

Two guinea pig studies were conducted to evaluate the skin sensitization ability of Isostearyl Neopentanoate. Each study employed a different test methodology.

Ten albino guinea pigs were tested by the Magnusson-Kligman maximization procedure[16] to determine the skin sensitization potential of Isostearyl Neopentanoate in petrolatum. The procedure called for three test phases: induction, booster, and challenge. During the induction phase, the left and right upper back area of each of the 10 female guinea pigs received 0.05 ml intradermal injections of 50 percent aqueous Freund's complete adjuvant, 5 percent Isostearyl Neopentanoate in propylene glycol, and 5 percent Isostearyl Neopentanoate in 50 percent aqueous Freund's complete adjuvant. Twenty-four hours before the booster, 10 percent aqueous sodium lauryl sulfate was applied unoccluded to the induction site. One week after the induction injection, a 0.1 ml topical booster of "full-strength" Isostearyl Neopentanoate was applied under an occlusive dressing to the same test site as used in the induction. The booster site remained occluded

for 48 hours. Two weeks following the topical booster, each guinea pig was challenged with 0.1 ml of 1.0 percent Isostearyl Neopentanoate in petrolatum on previously untreated sites on the left or right flank. The challenge dose was kept under an occlusive patch for 24 hours, after which time the patch was removed and the test site graded. One guinea pig developed barely perceptible to minimal skin erythema 48 hours following removal of the occlusive challenge patch, whereas a second animal developed the same reaction 72 hours following removal of the challenge patch. A third guinea pig had a barely perceptible to minimal skin erythema at both the 48- and 72-hour challenge evaluations. However, the reactions of this guinea pig may not have been due to Isostearyl Neopentanoate because it appeared that the animal may have scratched the test site. One of six control guinea pigs also developed minimal skin erythema. It was the investigator's opinion that Isostearyl Neopentanoate "did not demonstrate any discernible potential for allergic skin sensitization."[31]

The skin sensitization potential of Isostearyl Neopentanoate in pyrogen-free physiological saline was determined in 10 male, albino guinea pigs by the Landsteiner and Jacob method.[32] The test material was injected intracutaneously into the shaved back 3 times a week until a total of 10 injections had been made. The first injection for each animal consisted of 0.05 ml, and the remaining 9 injections were 0.1 ml each. Two weeks after the tenth injection, a challenge (retest) dose consisting of 0.05 ml of a freshly prepared solution was administered intracutaneously. The eleventh (retest) injection was administered just below the region of the 10 sensitizing injections. Twenty-four hours following each dose, skin reactions were evaluated and scored for diameter, height, and redness. The score for each animal was 0.0. The investigator considered Isostearyl Neopentanoate in physiological saline a "nonsensitizer."[33]

Comedogenicity/Pustologenicity

Isostearyl Neopentanoate was tested in two comedogenicity assays. In one assay, the ingredient at both 100 percent concentration and 50 percent concentration in mineral oil was applied to the ears of albino rabbits 5 days a week for 4 consecutive weeks (20 applications). One hundred percent Isostearyl Neopentanoate was not comedogenic, whereas 50 percent Isostearyl Neopentanoate in mineral oil was marginally comedogenic; neither of these materials was pustulogenic.[34]

In the second assay, a night cream containing 3 percent Isostearyl Neopentanoate was evaluated by application of the formulation to the ears of albino rabbits 5 days a week for 5 consecutive weeks (25 applications). The cream produced no significant comedone formation.[35]

Eye Irritation

Isostearyl Neopentanoate at 100 percent concentration was at most a minimal irritant to the rabbit eye.[14,36] Ocular irritation to cosmetic products containing this ingredient varied according to the formulation tested; eye reactions in rabbits ranged from no irritation to minimal irritation. Results of these studies are summarized in Table 5.

TABLE 3. Acute Oral Toxicity

Material Tested	*Isostearyl Neopentanoate Concentration (percent)*	*No. and Kind of Animal*	*Single Oral Dose*	*LD_{50} of Material*	*Comments*	*Reference*
Isostearyl Neopentanoate	100	5 groups of Wistar albino rats (5 rats/group)	2.5, 5.0, 10.0, 20.0, or 40.0 ml/kg	>40 ml/kg	No deaths during 14-day observation period following the single oral dose	12
Face makeup foundation (containing 36 percent Isostearyl Neopentanoate) as a 50 percent suspension in corn oil	18	5 Sprague-Dawley rats	15.8 g/kg	>15.8 g/kg (product in corn oil)	–	17
Lip product	16.05	10 fasted Sprague-Dawley rats (5 M and 5 F)	20 ml/kg	>20 ml/kg (product)	No abnormal findings observed at necropsy, which was performed 14 days after the single oral dose	18
Cosmetic product (containing 25 percent Isostearyl Neopentanoate) as a 50 percent suspension in sesame oil	12.5	3 groups of Sprague-Dawley rats (6 rats/group)	5, 10, or 20 g/kg	>20 g/kg (product in sesame oil)	No deaths or abnormal behavioral reactions during 2 weeks following the single oral dose; no lesions found at necropsy	19

Blusher (containing 32 percent Isostearyl Neopentanoate) as a 25 percent suspension in corn oil	8	10 fasted Harlan Wistar rats (5 M and 5 F)	5 g/kg	>5 g/kg (product in corn oil)	Poor grooming and soft stools observed for 3 days after the single oral dose. Males had an average weight loss of 25 g over a 7-day period, whereas females gained an average of 37 g over same period; no deaths occurred	20
Night cream (containing 3 percent Isostearyl Neopentanoate) as a 50 percent (w/v) aqueous solution	1.5	10 Sprague-Dawley rats (5 M and 5 F)	5 g/kg	>5.0 g/kg (aqueous product solution)	No deaths during 14-day observation period following the single oral dose	21
Moisturizing lotion	1.5	5 Sprague-Dawley rats	15.9 g/kg	>15.9 g/kg (product)	–	22
Body oil	2.5	10 Charles River CF-1 mice	15 ml/kg	>15 ml/kg (product)	No deaths during 5-day observation period following the single oral dose	23

TABLE 4. Skin Irritation

Material Tested	*Isostearyl Neopentanoate Concentration (percent)*	*No. of Albino Rabbits*	*Methods*	*Comments/Results*	*Reference*
Isostearyl Neopentanoate	100	3	Draize et al.[24]: 0.5 ml of test material applied under occlusive 24-hour patch to intact and abraded skin	No skin irritation observed at the 24- or 72-hour evaluations	13
Isostearyl Neopentanoate	100	9	0.5 ml of test material applied under occlusive 24-hour patch to clipped skin of the back	No skin irritation observed at the 24- or 72-hour evaluations	14
Isostearyl Neopentanoate	100	9	0.5 ml of test material applied under occlusive 24-hour patch to clipped skin of the back	No skin irritation observed at the 24- or 72-hour evaluations	15
Isostearyl Neopentanoate in aqueous solution	30	9	Test material applied under occlusive 24-hour patch to the clipped skin	No skin irritation observed at the 24- or 72-hour evaluations	15
Blusher	32	3	0.5 ml of product applied daily for 4 days to shaved back	Slight edema and dehydration of skin observed on Days 6 and 7 of a 7-day observation period; irritation index was 0.3 on a scale of 0 to 8.0	20

Lip product	16.05	6	0.5 ml of product applied under open patch to intact, clipped skin daily for 3 days	4/6 rabbits had a very slight skin erythema at the 72-hour evaluation	25
Moisturizer	5	9	Product applied under occlusive dressing to clipped skin for unspecified period of time	Irritation scores at the 2- and 24-hour evaluations were 0.39 and 0.06, respectively; the Primary Irritation Index was 0.39 on a scale of 0 to 4, indicating barely perceptible to minimal skin erythema	26
Night cream	3	6	48-hour patch containing product applied to clipped intact skin of back	The mean primary irritation score was 2.67, indicating mild irritation	27
Body oil	2.5	3	Draize[28]: 0.5 ml of product applied under occlusive 24-hour patch to intact and abraded skin	No skin irritation observed at the 24- or 72-hour evaluations	29
Eye shadow (aqueous "slurry")	1.2	9	Product applied under closed patch to clipped skin for unspecified period of time	No skin irritation observed at the 2- or 24-hour evaluations	30

TABLE 5. Eye Irritation

Material Tested	*Isostearyl Neopentanoate Concentration (percent)*	*No. of Albino Rabbits*	*Treatment of Exposed Eyes**	*Comments/Results*	*Reference*
Isostearyl Neopentanoate	100	6	NWR	The average score was 1.0, 1.0, and 0.0 on Days 1, 2, and 3 postinstillation, respectively (max. score/observation = 110); investigators considered the eye irritation to be "minimal"	14
Isostearyl Neopentanoate	100	3	NWR	Slight movement of nictitating membrane observed immediately following test material exposure; no irritation 1, 2, or 3 days post-instillation; behavior patterns and eating habits "within normal limits" during the 3-day observation period	36
Face makeup foundation	36	3	TNS	No ocular irritation observed	17
Blusher	32	6	TNS	Slight conjunctival redness observed in each rabbit 1 hour postinstillation; however, conjunctivae were clear at the 24 and 48 hour evaluations; corneal and iridial membranes appeared normal throughout the 7-day observation period	20
Lip product	16.05	6	NWR	2/6 rabbits had conjunctival irritation 24 hours posttreatment; however, no irritation was observed at the 72-hour grading; the product was not considered an eye irritant under Federal Hazardous Substances Act regulations[37]	38

Moisturizer	5	6	NWR	1/6 rabbits had minimal eye irritation 24 hours postinstillation; however, no irritation was observed at the 48-hour evaluation	26
Moisturizer	5	3	NWR	No ocular irritation observed 1, 2, 3, 4, or 7 days post-instillation	39
Night cream	3	9	WR(3 rabbits) 4 seconds after exposure; NWR (6 rabbits)	No ocular irritation observed in rabbits given a water rinse; in the group receiving no water rinse, 2/6 rabbits had conjunctival irritation at the 24-hour evaluation; no irritation was observed 2, 3, or 7 days post-instillation; the product was considered "practically nonirritating" to the no-rinse groups	40
Body oil	2.5	3	NWR	No ocular irritation observed 1, 2, 3, 4, or 7 days post-instillation	41
Moisturizing lotion	1.5	3	TNS	Minimal conjunctival irritation observed	22
Eye shadow	1.2	6	NWR	2/6 rabbits developed minimal ocular irritation	30

*In each study, the test material was instilled into one eye of the rabbit; the untreated eye served as a control. The single dose for liquid test materials was 0.1 ml. In some instances following the single exposure, the treated eye received a water rinse to remove residual test material. WR, water rinse; NWR, no water rinse; TNS, treatment not specified.

Phototoxicity

A night cream containing 3 percent Isostearyl Neopentanoate was evaluated for its ability to cause phototoxicity. Gauze patches containing the product were applied under occlusion to both the left and right sides of the clipped back of each of 6 New Zealand rabbits. No abrasions were made to the skin. After 2 hours of exposure, patches on the right side were removed and the test sites subsequently irradiated with ultraviolet (UV) light (Sylvania Light No. F-40-BLB) for 15 minutes. The patches on the irradiated side were then replaced. Forty-eight hours following UV exposure, all patches were removed. Treated sites were graded for erythema and edema at 49, 72, and 96 hours post-UV exposure. The mean primary skin irritation score calculated for nonirradiated sites and the mean phototoxic irritation score calculated for irradiated sites were both 2.67, indicating mild skin irritation. No significant difference was observed between nonirradiated and irradiated sites. It was concluded that the product containing 3 percent Isostearyl Neopentanoate was a mild primary skin irritant, but not a phototoxic skin irritant.[27]

Subchronic Oral Toxicity

Isostearyl Neopentanoate (100 percent) was administered by gavage to Sprague-Dawley rats for 93 days. Four groups of animals consisting of 10 males and 10 females per group were given the test material in doses of 0, 1.0, 2.0, or 4.0 ml/kg. All animals survived the duration of the study, and no adverse behavioral responses were noted. Weekly mean body weights and total body weight gains for all treatment groups were comparable to control values. "Unthrifty" hair was observed in each of the three exposed groups, and matted and oily hair occurred in groups receiving the 2.0 and 4.0 ml/kg dosage regimen. Hematocrit values and mean corpuscular volume were increased in males of the low dose (1.0 ml/kg) group at Week 7. Increases were observed in the neutrophil:lymph ratio at Week 13 in males of the high dose (4.0 ml/kg) group. Changes in serum glucose, serum alkaline phosphatase, serum urea nitrogen, urinary protein, urine specific gravity, and urinary pH were also noted in the three treatment groups. These changes were considered of no toxicological importance, since they were within the range of normal values established for the strain of animal used. In the case of serum glucose, the changes were also considered of no toxicological significance, since they were neither unidirectional nor time- or dose-related. Other hematologic parameters (hemoglobin, total and differential leukocyte counts, red blood cell count, mean corpuscular hemoglobin concentration), clinical chemistry parameters (serum glutamic pyruvic transaminase, serum glutamic oxaloacetic transaminase), and components of the urinalysis (glucose, occult blood, bilirubin, keytones, color) for each of the treatment groups were comparable to those of the control group. In the high dose (4.0 ml/kg) group, significant increases were observed in weights of liver and heart. The increase in hepatic weight was associated with a slight increase in the frequency and severity of hepatic cytoplasmic vacuolation; however, these changes were not considered pathologically significant. Renal weights were increased and splenic weights were decreased in the low dose (1.0 ml/kg) group, but there were no histopathological changes in these organs. No significant differences were observed between exposed and control groups with respect to weight of adrenals, brain,

lung, testes, or uterus. Gross examination of the skin, lungs, eyes, testes, liver, and cecum revealed no treatment-related lesions. Microscopic examination of the heart, spleen, stomach, lung, liver, brain, kidneys, adrenals, pancreas, testes, uterus, and bone marrow (sternum) also revealed no changes that could be attributed to the oral administration of Isostearyl Neopentanoate. The investigators concluded that Isostearyl Neopentanoate is safe in terms of cumulative systemic toxicity.[5]

CLINICAL ASSESSMENT OF SAFETY

Skin Irritation and Sensitization

The ability of Isostearyl Neopentanoate or cosmetic products containing this ingredient to cause skin irritation and sensitization was assessed in a number of clinical studies. One hundred percent Isostearyl Neopentanoate induced no skin sensitization and no significant skin irritation. Skin irritation to products containing Isostearyl Neopentanoate varied according to test methodology and product but was generally mild at most. Cosmetic products containing this ingredient produced no skin sensitization. Individual studies are discussed below; results are summarized in Table 6.

Ten subjects were exposed to 100 percent Isostearyl Neopentanoate in a 48-hour patch test. The upper portion of the back was used as the site of test material (0.5 ml) application. Skin irritation was graded on a scale of 0 (no reaction) to 6 (erythema with infiltration, vesicles, pustules, and/or erosions) 2 hours following removal of the patch. The test material elicited a skin reaction in 1 of the 10 subjects. This individual's reaction was given a score of 1.0, indicating a "slight non-inflammatory change in surface structure."[42]

Two 48-hour patch tests were conducted to evaluate the skin irritating ability of a night cream containing 3 percent Isostearyl Neopentanoate. The site of test material contact was the upper back in one study (10 subjects) and the forearm in the second study (10 subjects). Skin response was graded 2 hours following removal of the patches. No irritation was observed in the 20 subjects tested.[43,44]

No skin irritation was observed in another 48-hour patch test when 100 women were exposed on the upper back to a moisturizer containing 5 percent Isostearyl Neopentanoate.[45] In this test, treated sites were graded for erythema and edema both 15 minutes and 24 hours following removal of the occlusive patch.

Cosmetic products containing Isostearyl Neopentanoate were evaluated for skin irritation in three 24-hour patch tests. In the first study, 2 of 20 individuals developed skin irritation when given a single application of a moisturizer containing 5 percent Isostearyl Neopentanoate. Of the 2 reactors, one demonstrated a "barely perceptible" to minimal skin erythema, whereas a second had mild skin erythema. The Primary Irritation Index was 0.08, indicating that the moisturizer was a minimal skin irritant.[46] A lotion containing 4 percent Isostearyl Neopentanoate was also a minimal skin irritant (PII = 0.08) in a second 24-hour patch test involving 20 subjects. Two individuals developed "barely perceptible" to mild skin erythema in this study as well.[47] No skin irritation was observed in a third study when another 20 subjects were exposed for 24 hours to an eye shadow formulation containing 1.2 percent Isostearyl Neopentanoate.[48]

TABLE 6. Clinical Skin Irritation and Sensitization

Test	*Material Tested*	*Isostearyl Neopentanoate Concentration (percent)*	*No. of Subjects*	*Method*	*Comments/Results*	*Reference*
Skin irritation	Isostearyl Neopentanoate	100	10	Single 48-hour patch	1/10 subjects developed a "slight noninflammatory change in surface structure"	42
Skin irritation	Night cream	3	10	Single 48-hour patch (applied to back)	No skin irritation	44
Skin irritation	Night cream	3	10	Single 48-hour patch (applied to forearm)	No skin irritation	43
Skin irritation	Moisturizer	5	100	Single 48-hour patch	No skin irritation	45
Skin irritation	Moisturizer	5	20	Single 24-hour patch	2/20 subjects developed "barely perceptible" to mild skin erythema (PII = 0.08)	46
Skin irritation	Lotion	4	20	Single 24-hour patch	2/20 subjects developed "barely perceptible" to mild skin erythema (PII = 0.08)	47
Skin irritation	Eye shadow	1.2	20	–	No skin irritation	48
Skin irritation	Face makeup foundation	36	101	Fisher[49]	"Negative"	17
Skin irritation	Moisturizing lotion	1.5	100	Fisher[49]	"Negative"	50
Skin irritation	Moisturizer	5	20	"Use Test" (3 weeks of product use)	1/20 subjects developed dryness and/or increased scaliness of skin	51
Skin irritation	Cream	3	15	Daily patches to same site for 21 consecutive days	Mild skin irritation	52
Skin irritation/ sensitization	Isostearyl Neopentanoate	100	52	Modified Draize-Shelanski repeat insult patch test	No skin sensitization and no significant skin irritation	53

Skin irritation/ sensitization	Raw material mixture of 40 percent mineral oil and 60 percent Isostearyl Neopentanoate	60	103	Repeat insult patch test	Minimal skin irritation; no skin sensitization, hypopigmentation, or hyperpigmentation observed	54
Skin irritation/ sensitization	Blusher	32	210	Shelanski-Jordan repeat insult patch test	2/210 subjects developed skin irritation (erythema and papules); no skin sensitization was observed	55
Skin irritation/ sensitization	Blusher	32	151	Modified Draize-Shelanski repeat insult patch test	No skin irritation or sensitization	56
Skin irritation/ sensitization	Face product	25	54	Modified Draize-Shelanski repeat insult patch test	No skin irritation or sensitization	57
Skin irritation/ sensitization	Lip product	16.05	198	Modified Draize-Shelanski repeat insult patch test	4/198 subjects developed skin irritation (macular, faint erythema); no sensitization was observed	58
Skin irritation/ sensitization	Moisturizer	5	107	Repeat insult patch test	2/107 subjects developed minimal to mild skin erythema during induction phase; no skin sensitization was observed	59
Skin irritation/ sensitization	Moisturizer	5	103	Repeat insult patch test	6/106 subjects developed skin irritation during induction phase; no skin sensitization was observed in 98 panelists completing the study	60

A face makeup foundation containing 36 percent Isostearyl Neopentanoate and a moisturizing lotion containing 1.5 percent of the ingredient were tested for their skin-irritating properties on 101 and 100 subjects, respectively. The methods employed in each study were similar to those described by Fisher.[49] Occlusive patch test results for both products were reported as "negative."[17,50]

A "use test" was conducted with a moisturizer containing 5 percent Isostearyl Neopentanoate on two groups of teenagers (20 subjects/group). One group used the test moisturizer for 3 weeks followed by use of control moisturizer for the same length of time. The second group used the same two products but in reverse order. Skin conditions were assessed before the test and after each 3 weeks of product use. One of 20 subjects developed dryness and/or increased scaliness of the skin as a result of the test moisturizer, whereas no subjects had skin reactions to the control moisturizer. The investigator concluded that the test moisturizer's "capacity for evoking irritation is considered to be no different from that which would result from comparable usage of a currently-marketed moisturizer."[51]

A cosmetic cream containing 3 percent Isostearyl Neopentanoate was tested for cumulative skin irritation. Patch applications of the product were made to the upper back on the same site daily for 21 consecutive days. Mild irritation was observed in the 15 female volunteers completing the study.[52]

A modified Draize-Shelanski patch test was conducted to evaluate the ability of 100 percent Isostearyl Neopentanoate to cause primary skin irritation and/or skin sensitization. The cosmetic ingredient was applied under occlusion for 10 24-hour periods to the same site on the back of 43 female and 9 male subjects. After a 12-day nontreatment period, a 48-hour challenge patch was applied to the back. A second 48-hour challenge patch was applied following removal of the initial challenge patch. The challenge sites were graded both immediately and 24 hours after removal of each patch. Undiluted Isostearyl Neopentanoate caused no sensitization and no significant irritation.[53]

A repeated insult patch test was conducted on 103 female Caucasian subjects to assess skin irritation and sensitization of a raw material containing 40 percent mineral oil and 60 percent Isostearyl Neopentanoate. Mineral oil was also included in the testing as a nonirritating control. Patches containing the test substances were applied under semi-occlusion to the intact skin of the upper back of each subject. The patches remained in place for 48 hours (72 hours on weekends) and then removed. The treated sites were then graded and new patches were applied. This procedure was repeated for a total of 10 induction applications. Following a 2-week nonexposure period, a challenge patch was applied. The mean irritation scores were 0.117 ± 0.042 and 0.320 ± 0.151 for the nonirritating control (mineral oil) and the mineral oil/Isostearyl Neopentanoate mixture, respectively (the grading scale was not specified). No skin sensitization, hypopigmentation, hyperpigmentation, or other adverse reaction were observed.[54]

A Shelanski-Jordan Repeat Insult Patch Test was conducted on 210 subjects to determine the skin irritation and sensitization potential of a blusher containing 32 percent Isostearyl Neopentanoate. Test subjects consisted of both males and females between the ages of 18 and 65. The test material was placed on a gauze dressing and applied to the upper back of each subject for 24 hours. Following removal of the patch, test sites were graded for erythema and edema. Scores for

skin reactions were based on a scale of 0 (no irritation) to 4.0 (marked edema and vesicles). This test procedure was repeated every other day (Monday, Wednesday, Friday) for 3½ weeks for a total of 10 induction applications. Ten to 14 days after grading the tenth induction application, a challenge patch was applied for a 48-hour contact period. Seven to 10 days after removal of the initial challenge patch, a second 48-hour occlusive challenge patch was applied. Test sites were graded 48 hours following removal of the first challenge patch, and both 48 and 72 hours following removal of the second challenge patch. Two of the 210 subjects had single 2+ (erythema and papules) induction reactions; one reaction occurred after induction application number 6 and the second after induction application number 9. According to the investigator, these two reactions appeared to be "nonspecific irritation." There were no reactions to the two challenge applications. It was concluded that the blusher containing 32 percent Isostearyl Neopentanoate was "neither a strong irritant nor a contact sensitizer."[55]

The skin irritation and sensitization potential of a blusher containing 32 percent Isostearyl Neopentanoate was evaluated by means of a modified Draize-Shelanski Repeat Insult Patch Test. The product was applied under an occlusive patch to the upper back of each of 151 subjects. After 48 hours, the patch was removed and the test site subsequently graded for erythema and edema. This test procedure was repeated every other day (Monday, Wednesday, Friday) for 3½ weeks for a total of 10 induction applications. Ten to 14 days after the tenth insult, a challenge patch containing the test substance was applied for 48 hours. No skin reactions were observed on any of the subjects throughout the entire patch series.[56]

A face product containing 25 percent Isostearyl Neopentanoate produced no skin irritation or sensitization when tested on 43 female and 11 male subjects in a modified Draize-Shelanski-Jordan patch test. The procedure called for a total of 10 24-hour induction applications of the product to the upper back of each subject. After a 12-day nontreatment period, a challenge patch containing the product was applied for 48 hours. A second 48-hour patch was applied 7 days later. Challenge sites were evaluated 48 and 72 hours following application. All applications of the cosmetic product were under occluded conditions.[57]

One hundred ninety-eight male and female subjects between the ages of 16 and 60 participated in a modified Draize-Shelanski patch test. A lip product containing 16.05 percent Isostearyl Neopentanoate was impregnated onto impermeable patches, which were then applied to the upper back on Monday, Wednesday, and Friday for 3 consecutive weeks. The patches were removed and the test sites evaluated on the next scheduled patch replacement day. At the conclusion of this induction phase, a 2-week nontreatment period ensued, followed by two consecutive 48-hour challenge patches to previously untreated sites on the upper back. Challenge sites were graded at 48 and 96 hours. Skin reactions were scored on a scale of 0 (no reaction) to 4+ (bullae or extensive erosions). Four of the 198 subjects had single 1+ reactions (macular, faint erythema involving at least 25 percent of the test area); these reactions occurred following induction applications 2, 4, 7, and 8. No skin reactions occurred as a result of the challenge patches. It was concluded that the lip product had no clinically significant potential for primary irritation or contact sensitization.[58]

One hundred seven panelists were tested with a moisturizer containing 5 percent Isostearyl Neopentanoate to determine the product's ability to cause skin

irritation and/or sensitization. The induction phase consisted of a 24-hour occlusive patch to the upper back every other day for 3 consecutive weeks (nine 0.1 ml applications). A 24-hour occlusive challenge patch was applied in the sixth week of the study. Two of the 107 subjects developed skin reactions. Of the two reactors, one developed minimal to mild skin erythema after induction applications 2 through 8. The second reactor had moderate skin erythema as a result of the second induction patch. The latter subject's response was reported as indicative of "presensitization," that is, her intolerance existed before the test. No other panelists developed reactions during the induction or challenge phase. It was concluded that the moisturizer "did not exhibit any potential for inducing allergic sensitization."[59]

A moisturizer containing 5 percent Isostearyl Neopentanoate was evaluated for its skin irritating and sensitizing properties on 103 women between the ages of 18 and 65. The moisturizer was applied under an occlusive dressing to the upper back for a 48-hour contact period. Upon removal of the patch, the treated site was wiped free of excess moisturizer and graded for irritation. This procedure was repeated for a total of 10 applications with the exception that ". . . patches applied on Friday remained in place for 72 hours instead of 48 hours." After a 10-day nonexposure period, a 48-hour challenge patch was applied to a fresh site of the back. The treated site was graded both 15 minutes and 24 hours following patch removal. Six of the 103 panelists developed a positive irritation reaction during the induction period. The maximum reaction of these 6 individuals consisted of 5 "doubtful" reactions and 1 "erythema" reaction. None of the 98 panelists completing the challenge phase (5 subjects withdrew from the study during the challenge phase) had reactions to the challenge patch. Of the 5 subjects who withdrew from the test during the challenge phase, 2 had reactions during the induction period.[60]

Photosensitization

A lip formulation containing 16.05 percent Isostearyl Neopentanoate was evaluated for its ability to induce photosensitization. A 0.1 ml/cm^2 dose of the product was applied under an occlusive dressing to the skin of 27 subjects. After 24 hours of exposure, the patches were removed and the test sites subsequently irradiated with a UV light source at three times the individual's minimal erythema dose (MED). The MED of each panelist was determined in accordance with procedures outlined in the Federal Register.[61] A filtered Xenon Arc Solar Simulator (150 W) was used to produce a continuous emission spectrum in the UVA and UVB region (290–400 nm). Forty-eight hours following the UV exposure, the test sites were graded. The procedure of application, patching, and UV treatment was then repeated for a total of seven product and UV exposures. No phototoxicity or photoallergenicity was observed in any subject.[62]

SUMMARY

Isostearyl Neopentanoate is the ester of isotearyl alcohol and neopentanoic acid. It is used in cosmetics for its emollient properties. The ingredient functions as a binder for pressed powder makeup and as a pigment-dispersing agent in eye

makeup formulations. Although Isostearyl Neopentanoate is used in a variety of cosmetic products, its most frequent use occurs in eye shadow. Concentrations of this ingredient in cosmetic products generally range from 1 to 10 percent, although there are a few products with higher concentrations. Cosmetic products containing Isostearyl Neopentanoate are applied to the skin and/or eye area.

No significant published literature existed for Isostearyl Neopentanoate. As a result, much of the safety data available to the CIR Panel consisted of unpublished reports and studies provided by industry. Isostearyl Neopentanoate (100 percent) was nonirritating to the skin, minimally irritating to the eye, noncomedogenic, and nonpustulogenic in studies with rabbits. The acute oral LD_{50} in rats of 100 percent Isostearyl Neopentanoate was > 40 ml/kg, indicating that this ingredient was relatively nontoxic to this animal by oral administration. In studies with guinea pigs, 1.0 percent Isostearyl Neopentanoate in petrolatum and 0.1 percent in physiological saline were nonsensitizing to the skin. No cumulative systemic toxicity was observed in rats given 100 percent Isostearyl Neopentanoate orally for 93 days.

In clinical studies, Isostearyl Neopentanoate (100 percent) caused no sensitization and no significant irritation of the skin. A cosmetic lip product containing 16.05 percent of the ingredient produced no phototoxicity and no photoallergenicity.

DISCUSSION

The CIR Panel noted the lack of unpublished or published data on the mutagenicity, carcinogenicity, and teratogenicity of Isostearyl Neopentanoate and its acid and alcohol components. The alcohol and the acid resulting from hydrolysis of Isostearyl Neopentanoate ester would be expected to be metabolized along regular pathways and would not be expected to be converted to mutagenic, carcinogenic, and/or teratogenic metabolites.

CONCLUSION

On the basis of the available information, the Panel concludes that Isostearyl Neopentanoate is safe as a cosmetic ingredient in the present practices of use.

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REFERENCES

1. ESTRIN, N.F., CROSLEY, P.A., and HAYNES, C.R. (1982). *CTFA Cosmetic Ingredient Dictionary,* 3rd ed. Washington, DC: The Cosmetic, Toiletry and Fragrance Association, Inc.
2. CTFA. (October 1980). Submission of unpublished data by CTFA. Cosmetic ingredient chemical description: Isostearyl Neopentanoate. CTFA Code No. 2.*

*Available upon request: Administrator, Cosmetic Ingredient Review, 1110 Vermont Ave., NW, Suite 810, Washington, DC 20005.

3. COSMETECH LABORATORIES, INC. (April 26, 1983). Submission of unpublished data by CTFA. Gaschromatic analysis of Isostearyl Neopentanoate and accompanying letter from David Garlen, President (Cosmetech Lab. Inc.) to Dr. Gerald McEwen, Cosmetic, Toiletry and Fragrance Assoc.).*
4. VAN DYK and COMPANY. (April 25, 1983). Submission of unpublished data by CTFA. Letter from Ken Klein, Director of Technical Services (Van Dyk and Co.) to David Garlen, President (Cosmetech Lab. Inc.) regarding Isostearyl Neopentanoate.*
5. AVON PRODUCTS, INC. (January 31, 1983). Submission of unpublished data by CTFA. Thirteen week subchronic oral toxicity study in albino rats. The toxicological evaluation of Isostearyl Neopentanoate (R.I. Code 0187). Study Project Code AT0202. Phase II. Final Report.*
6. VAN DYK and COMPANY, INC. (January 1976). Submission of unpublished data by CTFA. Technical Bulletin. Ceraphyl 375. CTFA Code No. 2.*
7. FOOD and DRUG ADMINISTRATION (FDA). (December 22, 1981). Cosmetic product formulation data: ingredients used in each product category. Computer printout. Washington, DC.
8. FDA. (January 5, 1982). (a) Frequency of Trade Name Ingredients in the Cosmetic Product File and (b) Frequency of Common, Usual, or Chemical Names in the Cosmetic Product File. Computer printout. Washington, DC.
9. CFR. (Revised as of April 1, 1982). Title 21, Part 720.4. Voluntary Filing of Cosmetic Product Ingredient and Cosmetic Raw Material Composition Statement. Information requested about cosmetic products.
10. VAN DYK and COMPANY. (January 4, 1982). Submission of unpublished data by CTFA. UV Absorption Scan (210 nm to 500 nm). Isostearyl Neopentanoate (Ceraphyl 375) in Isopropyl Alcohol solvent. Concentration: 10,000, 2,500, 1,250 mg/L/1 cm. Batch No. 9305. Approx. molecular weight 348-90.*
11. BOULOGNE, J., KOULBANIS, C., and MICHELET, J. (January 2, 1982). Cosmetic composition in the form of an anhydrous cream of oily consistency. Fr. demande Patent No. 2486800. Oreal S.A.
12. FOOD and DRUG RESEARCH LABORATORIES, INC. (FDRL). (April 6, 1976). Submission of unpublished data by CTFA. Acute oral toxicity in rats. Isostearyl Neopentanoate. CTFA Code No. 3.*
13. BIO-TOXICOLOGY LABORATORIES, INC. (BTL). (April 7, 1972). Submission of unpublished data by CTFA. Primary skin irritation in rabbits. Isostearyl Neopentanoate. CTFA Code No. 5.*
14. CTFA. (May 20, 1980). Submission of unpublished data by CTFA. Toxicology Summary Report: Animal Tests. Skin and eye irritancy in rabbits. Isostearyl Neopentanoate. Batch No. 2985. CTFA Code No. 4.*
15. CTFA. (May 20, 1980). Submission of unpublished data by CTFA. Toxicology Summary Report: Animal tests. Primary skin irritation in rabbits. Isostearyl Neopentanoate. Code No. 0187. CTFA Code No. 6.*
16. MAGNUSSON, B., and KLIGMAN, A.M. (1969). The identification of contact allergens by animal assay. The guinea pig maximization test. J. Invest. Dermatol. **52**(3), 268-76.
17. COSMETIC, TOILETRY and FRAGRANCE ASSOCIATION. (CTFA). (February 1977). Submission of unpublished data by CTFA. Face makeup foundation containing 36 percent Isostearyl Neopentanoate. Acute oral toxicity. Acute eye irritation. Human patch test. In-House Code: FCR-10/1011B. CTFA Code No. 10.*
18. CTFA. (May 9, 1979). Submission of unpublished data by CTFA. CIR safety data test summary response form. Acute oral toxicity in rats. Lip product containing 16.05 percent Isostearyl Neopentanoate. Company Test Code: CSE 138.*
19. APPLIED BIOLOGICAL SCIENCES LABORATORY. (October 29, 1980). Submission of unpublished data by CTFA. Biological testing request. Acute oral toxicity in rats. Formula 2213-62-A containing 25 percent Isostearyl Neopentanoate in sesame oil. No. ABO-19.*
20. CTFA. (September 8, 1978). Submission of unpublished data by CTFA. Blusher containing 32 percent Isostearyl Neopentanoate. Acute oral, dermal, and ocular testing of BB-006, Lot 344-06a.*
21. FDRL. (May 1, 1979). Submission of unpublished data by CTFA. Acute oral toxicity in rats. Night cream containing 3 percent Isostearyl Neopentanoate. Laboratory No. 6205e.*
22. CTFA. (February 6, 1978). Submission of unpublished data by CTFA. Moisturizing lotion containing 1.5 percent Isostearyl Neopentanoate. Acute oral toxicity. Acute eye irritation. In-house Code FCR-10/1011C. CTFA Code No. 25.*
23. LEBERCO LABORATORIES. (October 23, 1979). Submission of unpublished data by CTFA. Acute oral toxicity in mice. Body oil containing 2.5 percent Isostearyl Neopentanoate. CTFA Code No. 22.*
24. DRAIZE, J.H., WOODARD, G., and CALVERY, H.O. (1944). Methods for the study of irritation and toxicity of substances applied topically to the skin and mucous membrane. J. Pharmacol. Exp. Ther. **82,** 377-90.
25. CTFA. (May 5, 1979). Submission of unpublished data by CTFA. Skin irritation test. CIR safety data test summary response form. Lip product containing 16.05 percent Isostearyl Neopentanoate. Company Test Code: CSE 138.*
26. CTFA. (March 7, 1980). Submission of unpublished data by CTFA. Toxicology summary report: Animal tests. Skin and eye irritation in rabbits. Moisturizer containing 5 percent Isostearyl Neopentanoate. Code No. 16434-11. CTFA Code No. 14.*

27. FDRL. (May 21, 1979). Submission of unpublished data by CTFA. Primary dermal phototoxic irritation study with New Zealand white rabbits. Laboratory No. 6164. CTFA Code No. 9.*
28. DRAIZE, J.H. (1959). Dermal toxicity in appraisal of the safety of chemicals. In: *Foods, Drugs and Cosmetics.* Div. of Pharmacology, FDA, Dept. of HEW. The Assoc. of Food and Drug Officials of the US Business Office, Bureau of Food and Drugs, Austin, Texas, pp. 46–59.
29. LEBERCO LABORATORIES. (October 12, 1979). Submission of unpublished data by CTFA. Skin irritation in rabbits. Body oil containing 2.5 percent Isostearyl Neopentanoate. CTFA Code No. 23.*
30. CTFA. (March 31, 1980). Submission of unpublished data by CTFA. Toxicology summary report: Animal test. Skin and eye irritation in rabbits. Eye shadow containing 1.2 percent Isostearyl Neopentanoate. Code No. 18234-02. CTFA Code No. 27.*
31. CTFA. (February 15, 1978). Submission of unpublished data by CTFA. Guinea pig allergy study. Isostearyl Neopentanoate. Study Code GPA-12-78. CTFA Code Nos. 8 and 14.*
32. LANDSTEINER, K., and JACOBS, J. (1935). Sensitization of animals with simple chemical compounds. J. Exp. Med. **61,** 643.
33. BTL. (May 16, 1972). Submission of unpublished data by CTFA. Landsteiner and Jacobs guinea pig sensitization study. Isostearyl Neopentanoate.*
34. CTFA. (September 9, 1980). Submission of unpublished data by CTFA. Comedogenic assay. Rabbit ear. Four-week assay. Samples 176-01 and 176-02. Mary Kay Cosmetics. CTFA Code No. 10.*
35. CTFA. (June 28, 1979). Submission of unpublished data by CTFA. Comedogenic assay. Rabbit ear. Night cream containing 3 percent Isostearyl Neopentanoate. CTFA Code No. 6.*
36. BTL. (April 11, 1972). Submission of unpublished data by CTFA. Eye irritation in rabbits. Isostearyl Neopentanoate. CTFA Code No. 7.*
37. CODE OF FEDERAL REGULATIONS (CFR). (Revised as of April 1979). Title 16 Part 1500.42. (16 CFR 1500. 42). Federal Hazardous Substances Act Regulations. Test for eye irritants.
38. CTFA. (April 13, 1979). Submission of unpublished data by CTFA. CIR safety data test summary response form. Eye irritation test. Lip product containing 16.05 percent Isostearyl Neopentanoate. Company Test Code: CSE 138.*
39. LEBERCO LABORATORIES, INC. (October 2, 1979). Submission of unpublished data by CTFA. Eye irritation in rabbits. Moisturizer containing 5 percent Isostearyl Neopentanoate. CTFA Code No. 15.*
40. FDRL. (April 5, 1979). Submission of unpublished data by CTFA. Eye irritation test in rabbits. Night cream (light pink cream) containing 3 percent Isostearyl Neopentanoate. Laboratory No. 6205e. CTFA Code No. 11.*
41. LEBERCO LABORATORIES. (October 15, 1979). Submission of unpublished data by CTFA. Eye irritation in rabbits. Body oil containing 2.5 percent Isostearyl Neopentanoate. CTFA Code No. 24.*
42. HERNDON, J.H. (April 28, 1980). Submission of unpublished data by CTFA. Herndon: Associate Professor, Internal Medicine; Chairman, Division of Dermatology. University of Texas/Southwestern Medical School. Forty-eight hour patch test with 100 percent Isostearyl Neopentanoate. Protocol No. 001-167.*
43. HERNDON, J.H. (February 27, 1979). Submission of unpublished data by CTFA. Herndon: Associate Professor, Internal Medicine; Chairman, Division of Dermatology. University of Texas/Southwestern Medical School. Forty-eight hour patch test with night cream containing 3 percent Isostearyl Neopentanoate. Protocol No. 001-123.*
44. HERNDON, J.H. (February 12, 1981). Submission of unpublished data by CTFA. Herndon: Associate Professor, Internal Medicine; Chairman, Division of Dermatology. University of Texas/Southwestern Medical School. Forty-eight hour patch test with night cream containing 3 percent Isostearyl Neopentanoate. Protocol No. 001-210.*
45. TESTKIT LABORATORIES, INC. (TKL). (June 22, 1979). Submission of unpublished data by CTFA. Human skin irritation. Forty-eight hour patch test. Moisturizer containing 5 percent Isostearyl Neopentanoate. CTFA Code No. 17.*
46. CTFA. (March 13, 1980). Submission of unpublished data by CTFA. Clinical evaluation report: Human patch test. Moisturizer containing 5 percent Isostearyl Neopentanoate. Test Material: 16434-11. CTFA Code No. 16.*
47. CTFA. (January 24, 1980). Submission of unpublished data by CTFA. Evaluation report: Human patch test. Lotion containing 4 percent Isostearyl Neopentanoate. Test Material: 17043-03. CTFA Code No. 20.*
48. CTFA. (April 10, 1980). Submission of unpublished data by CTFA. Clinical evaluation report: Human patch test. Eyeshadow containing 1.2 percent Isostearyl Neopentanoate. Test Material: 18234-02. CTFA Code No. 26.*
49. FISHER, A.A. (1973). *Contact Dermatitis,* 2nd ed. Philadelphia: Lea & Febiger.
50. CTFA. (February 7, 1977). Submission of unpublished data by CTFA. Moisturizing lotion containing 1.5 percent Isostearyl Neopentanoate. Human patch test. In-House Code FCR-10/1011C. CTFA Code No. 25.*

51. CTFA. (June 4, 1980). Submission of unpublished data by CTFA. Study No. APTC-121-80. Three week product use test. Moisturizer 16434-12 containing 5 percent Isostearyl Neopentanoate.*
52. INTERNATIONAL RESEARCH SERVICES, INC. (July, 1979). Submission of unpublished data by CTFA. Twenty-one day cumulative irritation study of fourteen products. Study 130. Cream containing 3 percent Isostearyl Neopentanoate.*
53. UNIVERSITY OF CALIFORNIA, LOS ANGELES (UCLA). (July 19, 1977). Submission of unpublished data by CTFA. Modified Draize-Shelanski Patch Test. Isostearyl Neopentanoate (100 percent). UCLA File No. 975.*
54. CTFA. (February 26, 1982). Submission of unpublished data by CTFA. Repeat insult sensitization study. Raw material 81-81: Mineral oil (40 percent) and Isostearyl Neopentanoate (60 percent).*
55. LEO WINTER ASSOCIATES, INC. (November 24, 1980). Submission of unpublished data by CTFA. Repeated insult patch testing. Shelanski-Jordan procedure. Blusher containing 32 percent Isostearyl Neopentanoate. Lot No. 344-06-A. Project-BB 006. CTFA Code No. 12.*
56. LEO WINTER ASSOCIATES, INC. (November 24, 1980). Submission of unpublished data by CTFA. Repeated insult patch testing and in-use testing. Modified Draize-Shelanski procedure. Blusher containing 32 percent Isostearyl Neopentanoate. BB-006. CTFA Code No. 13.*
57. UCLA. (November 17, 1980). Submission of unpublished data by CTFA. Modified Draize-Shelanski-Jordan patch test. Face product containing 25 percent Isostearyl Neopentanoate. UCLA File No. 2207. Project No. H80-6-2E.*
58. CTFA. (July/August 1979). Submission of unpublished data by CTFA. CIR safety data test summary response form. Modified Draize-Shelanski repeat insult patch test. Lip product containing 16.05 percent Isostearyl Neopentanoate. Company Test Code CSE 138.*
59. CTFA. (May 30, 1980). Submission of unpublished data by CTFA. Allergic contact sensitization test. Test No. APTC-112-80. Moisturizer 16434-12 containing 5 percent Isostearyl Neopentanoate. (Also titled: Contact allergy test report. CTFA Code No. 19).*
60. TKL. (September 7, 1980). Submission of unpublished data by CTFA. Repeated insult patch test. Moisturizer containing 5 percent Isostearyl Neopentanoate. CTFA Code No. 18.*
61. FEDERAL REGISTER. (1978). August 25, 38206-38369.
62. CTFA. (July/August 1979). Submission of unpublished data by CTFA. Human photosensitization study. Lip product containing 16.05 percent Isostearyl Neopentanoate. Company Test Code CSE 138.*