

Annex II-2

Human Data for LLNA Potency Evaluation

This page intentionally left blank

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Acetyl isovaleryl ¹	25	Petrolatum	5	1000	14.5	8	NA	3448	NA	NA	2155	+	(Opdyke 1982)
Acetyl isovaleryl	29	Petrolatum	5	1000	14.5	3.5	NA	3448	NA	NA	4926		(Opdyke 1982)
Aluminum chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	(Basketter et al. 1999b)
p-Aminobenzoic acid	23	Petrolatum	25	1000	14.5	0	17242	NA	NA	NA	NA	-	(Kligman 1966a)
Amylcinnamic aldehyde	25	1:3 EtOH/DEP	4.5	300	4.9	0	NA	NA	23622 ²	NA	NA	-	(RIFM 2007)
alpha-Amylcinnamyl alcohol	78	EtOH	8	200	5	1.3	NA	NA	NA	3200	12308	+	(Marzulli and Maibach 1980)
alpha-Amylcinnamyl alcohol	25	Petrolatum	8	1000	14.5	0	5517	NA	NA	NA	NA		(Opdyke 1974)
alpha-Amylcinnamyl alcohol	25	1:3 EtOH/DEP	4.5	300	4.9	0	NA	NA	3543 ³	NA	NA		(RIFM 2007)
Aniline	25	Petrolatum	20	1000	14.5	28	NA	13793	NA	NA	2463	+	(Kligman 1966a)
Anisyl alcohol	25	Petrolatum	NR	NR	NR	0	3448 ⁴	NA	NA	NA	NA	-	(RIFM 2007)
Basil oil	25	Petrolatum	4	1000	14.5	0	2759	NA	NA	NA	NA	-	(Lalko and Api 2006)
Benzalkonium chloride	24	Petrolatum	25	1000	14.5	0	17241	NA	NA	NA	NA	-	(Kligman 1966a)
Benzalkonium chloride	186	Petrolatum	5, then 1	500 mg	5 ⁵	0	NA	NA	5000	NA	NA		(Marzulli and Maibach 1976)
Benzocaine	22	Petrolatum	5	1000	14.5	4.5	NA	3448	NA	NA	3831	+	(Kligman 1966b)
Benzocaine	99	Water	20	500 mg	5	6	NA	NA	NA	20000	16667		(Marzulli and Maibach 1974)
Benzocaine	173	Water	10	500 mg	5	1.2	NA	NA	NA	10000	41667		(Marzulli and Maibach 1974)
Benzocaine	23	Petrolatum	25	1000	14.5	21.7	NA	17241	NA	NA	3973		(Kligman 1966a)
Benzocaine	92	Water	2	500 mg	5	0	NA	NA	2000	NA	NA		(Marzulli and Maibach 1974)

¹ Test substance is referred to as 5-methyl-2,3-hexanedione in the reference.

² No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

³ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

⁴ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

⁵ Concentrations tested were 5% for first four applications and then 1% for last six applications. NOEL is for 5%.

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Benzoic acid	NA	NA	NA	NA	NA	0	NA	NA	NA	NA	NA	-	(Gad et al. 1986)
Benzoisothiazolione	54	Aqueous	0.036	NR	NR	0	NA	NA	45	NA	NA	+	(Basketter et al. 1999c)
Benzoisothiazolione	58	Aqueous	0.0725	NR	NR	9	NA	NA	NA	90	50		(Basketter et al. 1999c)
Benzoyl peroxide	69	PEG and 1% sulfur	10	250 mg	3.88	36	NA	NA	NA	6443	895	+	(Poole et al. 1970)
Benzoyl peroxide	25	Gel	5	300 mg	1	84	NA	15000	NA	NA	893		(Leyden and Kligman 1977)
Benzoyl peroxide	25	Gel	5	300 mg	1	68	NA	15000	NA	NA	1103		(Leyden and Kligman 1977)
Benzoyl peroxide	25	Gel	10	300 mg	1	84	NA	30000	NA	NA	1786		(Leyden and Kligman 1977)
Benzoyl peroxide	25	Gel	10	300 mg	1	68	NA	30000	NA	NA	2206		(Leyden and Kligman 1977)
Benzyl alcohol	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	5906	NA	NA		+
Benzyl alcohol	NA	NA	NA	NA	NA	0	6897	NA	NA	NA	NA	(RIFM 2007)	
Benzyl alcohol	110	EtOH or EtOH/DEP	NA	NA	NA	0.91	NA	NA	NA	8858	48670	(RIFM 2007)	
Benzylbenzoate	NA	NA	NA	NA	NA	0	20690 ⁶	NA	NA	NA	NA	-	(RIFM 2007)
Benzylbenzoate	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	59050	NA	NA		(RIFM 2007)
Benzyl cinnamate	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	4720 ⁷	NA	NA	-	(RIFM 2007)
Benzyl cinnamate	NA	NA	NA	NA	NA	0	5517	NA	NA	NA	NA		(RIFM 2007)
Benzylidene acetone	62	Petrolatum	3	200	5	9.7	NA	NA	NA	1200	619	+	(Marzulli and Maibach 1980)
Benzylidene acetone	25	Petrolatum	2	1000	14.5	48	NA	1379	NA	NA	144		(Opdyke 1973)
Benzyl salicylate	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	17717	NA	NA	-	(RIFM 2007)

⁶ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

⁷ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Benzyl salicylate	NA	NA	NA	NA	NA	0	20690	NA	NA	NA	NA		(RIFM 2007)
Beryllium sulfate ⁸	22	Petrolatum	5	1000	14.5	82	NA	175	NA	NA	11	+	(Kligman 1966a)
Bourgeonal	26	NA	NA	NA	NA	23	NA	NA	NA	7087	1541	+	(RIFM 2007)
1-Butanol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	(Ryan et al. 2000)
Butyl glycidyl ether	24	Petrolatum	10	1000	14.5	79	NA	6897	NA	NA	437	+	(Kligman 1966a)
Carvone	81	NA	NA	NA	NA	4.9	NA	NA	NA	18898	19284	+	(RIFM 2007)
(Chloro)methylisothiazolinone	200	Body lotion	0.0015	NA	NA	0	NA	NA	1.25	NA	NA		(Cardin et al. 1986)
(Chloro)methylisothiazolinone	84	Shampoo	0.00125	300-500	3.5-3.6	1.2	NA	NA	NA	1.04	4.3		(Cardin et al. 1986)
(Chloro)methylisothiazolinone	602	Conditioner, Fabric softener, Body lotion, Water	0.001	NA	NA	0	NA	NA	0.83	NA	NA		(Cardin et al. 1986)
(Chloro)methylisothiazolinone	416	Soap, Shampoo, Conditioner	NR	NA	NA	0	NA	NA	0.42	NA	NA		(Cardin et al. 1986)
(Chloro)methylisothiazolinone	103	Shampoo	NR	NA	NA	0	NA	NA	0.50	NA	NA	+	(Cardin et al. 1986)
(Chloro)methylisothiazolinone	184	NA	0.00075	NA	NA	0	NA	NA	0.75	NA	NA		(Cardin et al. 1986)
(Chloro)methylisothiazolinone	109	NA	0.005	NA	NA	0	NA	NA	2.5	NA	NA		(SCCNFP 2003)
(Chloro)methylisothiazolinone	189	NA	0.0015	NA	NA	1.1	NA	NA	NA	1.34	6.1		(Cardin et al. 1986)
(Chloro)methylisothiazolinone	45	Water	0.002	NA	NA	4.4	NA	NA	NA	1.67	1.9		(Cardin et al. 1986)
(Chloro)methylisothiazolinone	116	NA	0.01	NA	NA	4.3	NA	NA	NA	5	5.8		(SCCNFP 2003)
(Chloro)methylisothiazolinone	196	NA	0.015	NA	NA	3.6	NA	NA	NA	7.5	10.4		(SCCNFP 2003)
Chlorpromazine	24	Petrolatum	25	1000	14.5	75	NA	17241	NA	NA	1149	+	(Kligman 1966a)

⁸ Data are for metal cation.

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Cinnamic aldehyde	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	591	NA	NA	+	(RIFM 2007)
Cinnamic aldehyde	55	EtOH	1	200	5	1.8	NA	NA	NA	400	1111		(Marzulli and Maibach 1980)
Cinnamic aldehyde	41	EtOH	1	200	5	12	NA	345	NA	NA	167		(Danneman et al. 1983)
Cinnamic aldehyde	41	EtOH or EtOH/DEP	NA	NA	NA	12	NA	NA	NA	775	322		(RIFM 2007)
Cinnamic aldehyde	53	Petrolatum	1	200	5	0	NA	NA	400	NA	NA		(Marzulli and Maibach 1980)
Cinnamic aldehyde	NA	EtOH	0.5	200	5	0	NA	NA	200	NA	NA		(Danneman et al. 1983)
Cinnamic aldehyde	25	Petrolatum	2	1000	14.5	44	NA	1379	NA	NA	157		(Opdyke 1979b)
Cinnamic aldehyde	25	Petrolatum	3	1000	14.5	12	NA	2069	NA	NA	862		(Opdyke 1979b)
Cinnamyl alcohol	150	70% EtOH	4	200	4	2.7	NA	NA	NA	2000	3704	+	(Jordan and King 1977)
Cinnamyl alcohol	54	Dimethyl phthalate	6	200	5	3.7	NA	NA	NA	2400	3243		(Steltenkamp et al. 1980)
Cinnamyl alcohol	25	70% EtOH	4	200	4	16	NA	2000	NA	NA	625		(Jordan and King 1977)
Cinnamyl alcohol	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	3000	NA	NA		(RIFM 2007)
Cinnamyl alcohol	109	EtOH or EtOH/DEP	NA	NA	NA	1.8	NA	NA	NA	4724	13122		(RIFM 2007)
Cinnamyl alcohol	25	Petrolatum	4	1000	14.5	0	2759	NA	NA	NA	NA		(Greif 1967)
Cinnamyl alcohol	25	Petrolatum	4	200	4	0	2000	NA	NA	NA	NA		(Jordan and King 1977)
Cinnamyl alcohol	150	Petrolatum	4	200	4	0	NA	NA	2000	NA	NA		(Jordan and King 1977)
Cinnamyl alcohol	200	Petrolatum	10	1000	14.5	20	NA	6897	NA	NA	1724		(Steltenkamp et al. 1980)
Cinnamyl alcohol	25	Hydrophilic ointment	10	1000	14.5	8	NA	6897	NA	NA	4310		(Steltenkamp et al. 1980)

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Cinnamyl nitrile	NA	NA	NA	NA	NA	0	NA	NA	1476	NA	NA	+	(RIFM 2007)
Cinnamyl nitrile	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	1063	NA	NA		(RIFM 2007)
Cinnamyl nitrile	NA	NA	NA	NA	NA	0	3448	NA	NA	NA	NA		(RIFM 2007)
Cinnamyl nitrile	38	EtOH or EtOH/DEP	NA	NA	NA	5.3	NA	NA	NA	1938	1828		(RIFM 2007)
Citral	84	EtOH	1	200	5	2.38	NA	NA	NA	400	840	+	(Steltenkamp et al. 1980)
Citral	56	Petrolatum	8	300	6.45	11	NA	NA	NA	3721	1691		(Opdyke 1979b)
Citral	24	Petrolatum	2	1000	14.5	8	NA	1379	NA	NA	862		(Opdyke 1979b)
Citral	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	1400	NA	NA		(RIFM 2007)
Citral	NA	EtOH or EtOH/DEP	8	NA	NA	62.5	NA	NA	NA	3876	310		(RIFM 2007)
Citral	82	EtOH	0.5	200	5	0	NA	NA	200	NA	NA		(Steltenkamp et al. 1980)
Citral	50	Petrolatum	4	300	6.45	11	NA	NA	NA	1861	1691		(Opdyke 1979b)
Citronella oil	25	Petrolatum	8	1000	14.5	0	5517	NA	NA	NA	NA		-
dl-Citronellol	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	29528 ⁹	NA	NA	+	(RIFM 2007)
dl-Citronellol	NA	NA	NA	NA	NA	0	4138	NA	NA	NA	NA		(RIFM 2007)
dl-Citronellol	104	Petrolatum	10	200	5	0	NA	NA	4000	NA	NA		(RIFM 2007)
dl-Citronellol	25	Petrolatum	4	300	4	0	3000	NA	NA	NA	NA		(RIFM 2007)
dl-Citronellol	73	EtOH	10	200	5	14	NA	NA	NA	4000	1429		(RIFM 2007)
Clove Oil (bud)	25	Petrolatum	5	1000	14.5	0	3448	NA	NA	NA	NA	-	(Opdyke 1975a)
Clove oil (leaf)	25	Petrolatum	5	1000	14.5	0	3448	NA	NA	NA	NA		(Lalko and Api 2006)
Clove oil (stem)	25	Petrolatum	10	1000	14.5	0	6897	NA	NA	NA	NA		(Opdyke 1975b)

⁹ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Cobalt (II) salts ¹⁰	25	Petrolatum	25	1000	14.5	40	NA	3620	NA	NA	453	+	(Kligman 1966a)
Cobalt (II) salts ¹¹	24	Petrolatum	10	1000	14.5	42	NA	1448	NA	NA	172		(Kligman 1966b)
Copper (II) chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	(Basketter et al. 1999b)
Coumarin	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	3543	NA	NA	+	(RIFM 2007)
Coumarin	25	Petrolatum	8	1000	14.5	0	5517	NA	NA	NA	NA		(Marzulli and Maibach 1980)
Coumarin	42	EtOH or EtOH/DEP	NA	NA	NA	2.4	NA	NA	NA	8858	18454		(RIFM 2007)
Coumarin	104	Petrolatum	8	200	5	0	NA	NA	3200	NA	NA		(Marzulli and Maibach 1980)
Coumarin	73	EtOH	8	200	5	1.4	NA	NA	NA	3200	11429		(Marzulli and Maibach 1980)
Cyclamen aldehyde	64	NA	4	NA	NA	0	NA	NA	4724	NA	NA		-
Damascone	23	NA	NA	NA	NA	0	NA	NA	50	NA	NA	-	(RIFM 2007)
t-alpha Damascone	≥100	DEP	NA	NA	NA	0	NA	NA	250 ¹²	NA	NA	-	(RIFM 2007)
trans beta Damascone	54	Petrolatum	NA	NA	NA	0	NA	NA	310 ¹³	NA	NA	-	(RIFM 2007)
trans beta Damascone	100	DEP	NA	NA	NA	0	NA	NA	250	NA	NA		(RIFM 2007)
delta Damascone	54	EtOH or EtOH/DEP	NA	NA	NA	12.96	NA	NA	62	500	192.9	-	(RIFM 2007)
Diethylenetriamine	25	Petrolatum	10	1000	14.5	84	NA	6897	NA	NA	411	+	(Kligman 1966a)
Diethylmaleate	24	Petrolatum	4	300	4	100	NA	3000	NA	NA	150	+	(Marzulli and Maibach 1980)
Diethylmaleate	187	Petrolatum	4	200	5	7.5	NA	NA	NA	1600	1067		(Marzulli and Maibach 1980)
Diethyl phthalate	25	NR	10	1000	14.5	0	6896	NA	NA	NA	NA	-	(Greif 1967)
Dihydrocoumarin	62	Petrolatum	20	200	5	52	NA	NA	NA	8000	769	+	(Marzulli and Maibach 1980)

¹⁰ Test substance was cobalt sulfate.

¹¹ Test substance was cobalt sulfate.

¹² No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

¹³ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Dihydrocoumarin	25	Petrolatum	20	300	4	100	NA	15000	NA	NA	750		(Marzulli and Maibach 1980)
Dimethyl sulfoxide	23	Petrolatum	75	1000	14.5	0	51724	NA	NA	NA	NA	-	(Kligman 1966a)
2,4-Dinitrochlorobenzene	165	Acetone	62.5 µg	100	7.1	8	NA	NA	NA	8.8	5.5	+	(Friedmann et al. 1983)
2,4-Dinitrochlorobenzene	22	Acetone	0.125	24	0.8	91	NA	NA	NA	38.2	2.1		(Rees et al. 1989) ¹⁴
Ethyl acrylate	25	Petrolatum	4	300	4	40	NA	3000	NA	NA	375		(Marzulli and Maibach 1980)
Ethyl acrylate	78	EtOH	4	200	5	7.7	NA	NA	NA	1600	1039		(Marzulli and Maibach 1980)
Ethyl acrylate	70	Petrolatum	4	200	5	5.7	NA	NA	NA	1600	1404	+	(Marzulli and Maibach 1980)
Ethyl acrylate	28	Petrolatum	4	200	5	0	NA	NA	1600	NA	NA		(Marzulli and Maibach 1980)
Ethyl acrylate	27	Petrolatum	4	200	5	0	NA	NA	1600	NA	NA		(Marzulli and Maibach 1980)
Ethylenediamine	61	Petrolatum	3	200	5	8.2	NA	NA	NA	1200	732	+	(Marzulli and Maibach 1976)
Ethyl vanillin	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	(De Groot et al. 1994)
Eugenol	108	75% DEP/25% EtOH	5	300	4.9	0	NA	NA	5906	NA	NA		(RIFM 2007)
Eugenol	73	EtOH	8	200	5	2.7	NA	NA	NA	3200	5926		(Marzulli and Maibach 1980)
Eugenol	NA	EtOH	2.5	NA	NA	0	NA	NA	1938	NA	NA	+	(RIFM 2007)
Eugenol	25	Petrolatum	8	300	5	0	5517	NA	NA	NA	NA		(Marzulli and Maibach 1980)
Eugenol	104	Petrolatum	8	200	5	0	NA	NA	3200	NA	NA		(Marzulli and Maibach 1980)
Farnesol	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	2755	NA	NA	+	(RIFM 2007)
Farnesol	75	NA	NA	NA	NA	13	NA	6897	NA	NA	2593		(RIFM 2007)

¹⁴ Nonstandard protocol. No repeated exposures.

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference	
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)				
Formaldehyde	25	Petrolatum	1.85	1000	14.5	72	NA	NA	NA	1276	89	+	(Kligman 1966a)	
Formaldehyde	89	Petrolatum	1	500 mg	5	4.5	NA	NA	NA	370	411		(Marzulli and Maibach 1974)	
Formaldehyde	45	Petrolatum	0.1	500 mg	5	0	NA	NA	37	NA	NA		(Marzulli and Maibach 1974)	
Geraniol	40	EtOH/DEP (75:25 w/w)	5	300	4.9	0	NA	NA	3061 ¹⁵	NA	NA	+	(Basketter et al. 2005)	
Geraniol	25	Petrolatum	5	1000	14.5	80	NA	3448	NA	NA	216		(Malten et al. 1984)	
Geraniol	73	EtOH	10	200	5	2.7	NA	NA	NA	4000	7407		(Marzulli and Maibach 1980)	
Geraniol	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	11811	NA	NA		(RIFM 2007)	
Geraniol	104	Petrolatum	10	200	5	0	NA	NA	4000	NA	NA		(Marzulli and Maibach 1980)	
Geraniol	25	Petrolatum	6	1000	14.5	0	4138	NA	NA	NA	NA		(Marzulli and Maibach 1980)	
Geranium oil	25	Petrolatum	10	1000	14.5	0	6897	NA	NA	NA	NA		-	(Lalko and Api 2006)
Glutaraldehyde	30	Petrolatum	5	500 mg	5	23.3	NA	NA	NA	5000	1073		+	(Marzulli and Maibach 1974)
Glutaraldehyde	102	Petrolatum	5	500 mg	5	0	NA	NA	100	NA	NA	(Marzulli and Maibach 1974)		
Glycerol	NA	NA	NA	NA	NA	0	13793	NA	NA	NA	NA	-	(Gad et al. 1986)	
Glyoxal	24	Petrolatum	10	1000	14.5	100	NA	6897	NA	NA	345	+	(Kligman 1966a)	
Gold chloride	23	Petrolatum	2	1000	14.5	70	NA	1379	NA	NA	98.5	+	(Kligman 1966a)	
Hexane	25	Petrolatum	100	1000	14.5	0	68966	NA	NA	NA	NA	-	(Kligman 1966a)	
trans-2-Hexenal	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	24	NA	NA	+	(RIFM 2007)	
trans-2-Hexenal	25	EtOH or EtOH/DEP	NA	NA	NA	24	NA	NA	NA	236	49.2		(RIFM 2007)	

¹⁵ Corrected NOEL to reflect RIFM HRIPT protocol.

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference	
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)				
Hexyl cinnamic aldehyde	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	23662 ¹⁶	NA	NA	-	(RIFM 2007)	
2-Hexylidene cyclopentanone	51	NA	NA	NA	NA	9.8	NA	NA	NA	500	255	+	(RIFM 2007)	
Hexyl salicylate	NA	NA	NA	NA	NA	0	2069	NA	35433	NA	NA	-	(RIFM 2007)	
Hydrocortisone	25	Petrolatum	25	1000	14.5	0	17242	NA	NA	NA	NA	-	(Kligman 1966a)	
Hydroxycitronellal	26	Petrolatum	5	1000	14.5	0	3448	NA	NA	NA	NA	+	(Ford et al. 1988)	
Hydroxycitronellal	104	Petrolatum	12	1000	14.5	16	NA	8276	NA	NA	2586		(Ford et al. 1988)	
Hydroxycitronellal	66	EtOH/DEP (75:25 w/w)	5	300	4.9	2	NA	NA	NA	3061	7653		(Ford et al. 1988)	
Hydroxycitronellal	38	EtOH	7.5	200	5	2.6	NA	NA	NA	3000	5769		(Steltenkamp et al. 1980)	
Hydroxycitronellal	73	EtOH	20	200	5	19	NA	NA	NA	8000	2105		(Marzulli and Maibach 1980)	
Hydroxycitronellal	150	Petrolatum	4	200	4	0.7	NA	NA	NA	2000	14286		(Jordan and King 1977)	
Hydroxycitronellal	99	Petrolatum	20	200	5	1	NA	NA	NA	8000	40000		(Marzulli and Maibach 1980)	
Hydroxycitronellal	25	Petrolatum	10	1000	14.5	8	NA	6897	NA	NA	4311		(Ford et al. 1988)	
Hydroxycitronellal	81	EtOH or EtOH/DEP	NA	NA	NA	31	NA	NA	5000	5906	956		(RIFM 2007)	
Hydroxycitronellal	65	EtOH/DEP (75:25 w/w)	2.5	300	4.9	0	NA	NA	1530	NA	NA		(Ford et al. 1988)	
Hydroxycitronellal	25	Petrolatum	5	1000	14.5	0	3448	NA	NA	NA	NA		(Opdyke 1974)	
Hydroxycitronellal	25	Petrolatum	12	1000	14.5	0	8276	NA	NA	NA	NA		(Opdyke 1974)	
Imidazolidinyl urea	150	Aqueous soap solution	2	200	4	1.3	NA	NA	NA	1000	3846		+	(Jordan and King 1977)
Imidazolidinyl urea	25-30	Aqueous soap solution	2	1000	4	0	5000	NA	NA	NA	NA			(Jordan and King 1977)
Isocyclemone E	NA	NA	NA	NA	NA	0	NA	NA	47244	NA	NA		-	(RIFM 2007)

¹⁶ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Isocyclocitral ¹⁷	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	7087	NA	NA	-	(RIFM 2007)
Isocyclocitral	NA	NA	NA	NA	NA	0	2759	NA	NA	NA	NA	-	(RIFM 2007)
Isocyclogeraniol	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	3898	NA	NA	+	(RIFM 2007)
Isocyclogeraniol	49	EtOH or EtOH/DEP	NA	NA	NA	4	NA	NA	NA	5000	6250	+	(RIFM 2007)
Isoeugenol	NA	EtOH	0.5	NA	NA	0	NA	NA	69	NA	NA	+	(RIFM 2007)
Isoeugenol	38	EtOH	1	NA	NA	5	NA	NA	NA	775	775	+	(RIFM 2007)
Isoeugenol	NA	EtOH	NA	NA	NA	0	NA	NA	250	NA	NA	+	(RIFM 2007)
Isoeugenol	73	EtOH	8	200	5	12	NA	NA	NA	3200	1333	+	(Marzulli and Maibach 1980)
Isomethyl ionone	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	70866 ¹⁸	NA	NA	-	(RIFM 2007)
Isopropanol	NA	NA	NA	NA	NA	0	6897	NA	NA	NA	NA	-	(Basketter et al. 1998)
Isopropyl myristate	25	NA	NA	NA	NA	0	13793	NA	NA	NA	NA	-	(Opdyke 1976b)
Jasmine absolute (grandiflorum)	75	EtOH or EtOH/DEP	NA	NA	NA	10.7	NA	NA	1475	2069	966.8	+	(RIFM 2007)
Jasmine absolute (sambac)	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	8858 ¹⁹	NA	NA	-	(RIFM 2007)
Kanamycin	24	Petrolatum	25	1000	14.5	46	NA	17241	NA	NA	1874	+	(Kligman 1966a)
Lead acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	(Rycroft et al. 1993)
Lemongrass oil	25	Petrolatum	5	1000	14.5	0	3448	NA	NA	NA	NA	-	(RIFM 2007)

¹⁷ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

¹⁸ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

¹⁹ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Lilial	NA	DEP	5	NA	NA	0	NA	NA	3750	NA	NA	+	(RIFM 2007)
Lilial	106	75% DEP/ 25% EtOH	25	NA	NA	0	NA	NA	29527	NA	NA		(Cocchiara and Api 2005)
Lilial	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	4125	NA	NA		(RIFM 2007)
Lilial	225	EtOH or EtOH/DEP	NA	NA	NA	0.44	NA	NA	NA	29528	335545		(RIFM 2007)
d-Limonene	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	10000 ²⁰	NA	NA	-	(RIFM 2007)
d-Limonene	NA	NA	NA	NA	NA	0	5517	NA	NA	NA	NA		(RIFM 2007)
Linalool	NA	NA	NA	NA	NA	0	13793 ²¹	NA	NA	NA	NA	-	(RIFM 2007)
Linalool	25	NR	8	1000	14.5	0	5517	NA	NA	NA	NA		(Greif 1967)
Linalool	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	15000	NA	NA		(RIFM 2007)
Litsea cubeba oil	25	Petrolatum	8	1000	14.5	0	5517	NA	NA	NA	NA	-	(RIFM 2007)
Lyrall HMPCC	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	4000	NA	NA	-	(RIFM 2007)
Lyrall HMPCC	108	75% EtOH/25% DEP	15	300	NR	0	NA	NA	8264	NA	NA		(RIFM 2007)
Majantal	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	9900	NA	NA	-	(RIFM 2007)
Manganese chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	(Nguyen and Allen 1979)
Menthadiene-7-methyl formate	79	NA	NA	NA	NA	10.13	690	NA	1063	6900	3405.7	+	(RIFM 2007)
2-Mercaptobenzothiazole	24	Petrolatum	25	1000	14.5	38	NA	17241	NA	NA	2269	+	(Kligman 1966a)
2-Mercaptobenzothiazole	24	Petrolatum	10	1000	14.5	21	NA	6987	NA	NA	1642		(Kligman 1966b)

²⁰ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

²¹ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Mercuric (II) chloride ²²	24	Petrolatum	2	500 mg	5	8	NA	NA	NA	1478	924	+	(Marzulli and Maibach 1974)
Mercuric (II) chloride	25	Petrolatum	2	1000	14.5	92	NA	1019	NA	NA	55		(Kligman 1966a)
4-Methoxyacetophenone	25	Petrolatum	6	1000	14.5	0	4138	NA	NA	NA	NA	-	(Opdyke 1974)
Methoxy dicyclopentadiene carboxaldehyde ²³	NA	DEP	NA	NA	NA	0	NA	NA	5000	NA	NA	-	(RIFM 2007)
2-Methoxy-4-methylphenol	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	118 ²⁴	NA	NA	-	(RIFM 2007)
Methylanisylidene acetone	24	Petrolatum	8	1000	14.5	67	NA	552	NA	NA	412	+	(Opdyke 1979a)
alpha-Methyl cinnamic aldehyde	>100	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	3543 ²⁵	NA	NA	-	(RIFM 2007)
alpha-Methyl cinnamic aldehyde	NA	NA	NA	NA	NA	0	5517	NA	NA	NA	NA		(RIFM 2007)
6-Methylcoumarin	25	Petrolatum	4	1000	14.5	0	2759	NA	NA	NA	NA	-	(Opdyke 1976a)
Methylhexanedione	25	Petrolatum	5	300	4	8	NA	3750	NA	NA	2344	+	(Opdyke 1982)
Methylhexanedione	29	Petrolatum	5	300	4	3.4	NA	3750	NA	NA	5515		(Opdyke 1982)
Methylhydrocinnamal	23	DEP	2	1000	14.5	0	1379	NA	NA	NA	NA	+	(RIFM 2007)
Methylhydrocinnamal	24	NA	20	1000	14.5	29	NA	13793	NA	NA	2378		(RIFM 2007)
Methylisothiazolinone	98	Water	0.03	200	4	0	NA	NA	15	NA	NA	+	(SCCNFP 2003)
Methylisothiazolinone	100	Water	0.02	200	4	0	NA	NA	10	NA	NA		(Basketter et al. 2007)
Methylisothiazolinone	97	NA	0.01	NA	NA	0	NA	NA	5	NA	NA		(SCCNFP 2003)
Methylisothiazolinone	NA	NA	0.04	NA	NA	0.9	NA	NA	NA	20	111		(SCCNFP 2003)
Methylisothiazolinone	NA	NA	0.05	NA	NA	0.5	NA	NA	NA	45	450		(SCCNFP 2003)
Methyl 2-nonynoate	NA	75% EtOH/25% DEP	NA	NA	NA	0	NA	NA	24	NA	NA	+	(RIFM 2007)
Methyl 2-nonynoate	67	75% EtOH/25% DEP	NA	NA	NA	7.5	NA	NA	NA	118	79		(RIFM 2007)

²² LOEL and DSA₀₅ expressed as amount of mercury (Hg) metal.

²³ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

²⁴ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

²⁵ No sensitization was observed in human studies. Doses reported reflect the highest concentration tested, not necessarily the highest achievable NOEL.

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Methyl 2-octynoate	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	118	NA	NA	+	(RIFM 2007)
Methyl 2-octynoate	41	EtOH or EtOH/DEP	NA	NA	NA	2.5	NA	NA	NA	194	388		(RIFM 2007)
Methyl salicylate	27	Petrolatum	NA	NA	NA	0	5517	NA	NA	NA	NA	-	(Opdyke 1979b)
Neomycin sulfate	186	Petrolatum	5	500,000 µg	14.5	1.6	NA	NA	NA	5000	15625	+	(Marzulli and Maibach 1974)
Neomycin sulfate	54	Petrolatum	0.5	500,000 µg	14.5	5.6	NA	NA	NA	500	446		(Marzulli and Maibach 1974)
Neomycin sulfate	23	Petrolatum	10	1000	14.5	17	NA	6897	NA	NA	2028		(Kligman 1966b)
Neomycin sulfate	24	Petrolatum	25	1000	14.5	21	NA	17241	NA	NA	4105		(Kligman 1966b)
Neomycin sulfate	25	Petrolatum	10	1000	14.5	4	NA	6897	NA	NA	8621		(Kligman 1966b)
Nickel (II) salts	23	Petrolatum	1	1000	14.5	26	NA	154	NA	NA	28	+	(Kligman 1966b)
Nickel (II) salts	24	Petrolatum	1	1000	14.5	17	NA	154	NA	NA	45		(Kligman 1966b)
Nickel (II) salts	25	Petrolatum	10	1000	14.5	48	NA	1540	NA	NA	16		(Kligman 1966a)
Oakmoss	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	700	NA	NA	+	(RIFM 2007)
Oakmoss	NA	NA	NA	NA	NA	0	1724	NA	NA	NA	NA		(RIFM 2007)
Oakmoss	95	EtOH or EtOH/DEP	NA	NA	NA	2.1	NA	NA	NA	1417	3374		(RIFM 2007)
Octanoic acid	NA	NA	NA	NA	NA	0	690	NA	NA	NA	NA	-	(Basketter et al. 1999a)
1-Octen-3-yl acetate	175	EtOH or EtOH/DEP	NA	NA	NA	5.14	NA	NA	3543	6900	6712.1	+	(RIFM 2007)
Palmarosa oil	25	Petrolatum	4	1000	14.5	0	5517	NA	NA	NA	NA	-	(RIFM 2007)
Penicillin G	24	Petrolatum	25	1000	14.5	67	NA	17241	NA	NA	1287	+	(Kligman 1966a)
Penicillin G	22	Petrolatum	0.2	1000	14.5	9.1	NA	138	NA	NA	76		(Kligman 1966b)
Penicillin G	25	Petrolatum	10	1000	14.5	36	NA	6897	NA	NA	958		(Kligman 1966b)
Penicillin G	23	Petrolatum	0.1	1000	14.5	0	69	NA	NA	NA	NA		(Kligman 1966b)
Penicillin G	25	Petrolatum	10	1000	14.5	20	NA	6897	NA	NA	1724		(Kligman 1966b)
Pentachlorophenol	25	Petrolatum	5	1000	14.5	8	NA	3448	NA	NA	2155	+	(Kligman 1966b)
Pentaerythritol triacrylate	9	Petrolatum	10%	360	4	78	NA	NA	NA	9000	576	+	(Nethercott 1978)

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Perillaldehyde	54	NA	NA	NA	NA	9.3	NA	NA	NA	2760	1484	+	(RIFM 2007)
Peru balsam absolute	25	NA	NA	NA	NA	32	5517	NA	950	5517	862	+	(RIFM 2007)
Phenyl benzoate	107	DEP	8	NA	NA	0.9	NA	NA	NA	9448	52489	+	(RIFM 2007)
Phenylacetaldehyde	110	75% DEP, 25% EtOH	0.5	NA	NA	0	NA	NA	591	NA	NA	+	(RIFM 2007)
Phenylacetaldehyde	53	EtOH or EtOH/DEP	NA	NA	NA	13	NA	NA	591	1181	454		(RIFM 2007)
Phenylacetaldehyde	25	Petrolatum	2	1000	14.5	44	NA	1379	NA	NA	157		(Opdyke 1979b)
Phenylacetaldehyde	25	Petrolatum	2	1000	14.5	16	NA	1379	NA	NA	431		(Opdyke 1979b)
Phenylacetaldehyde	23	Petrolatum	2	1000	14.5	52	NA	1379	NA	NA	133		(Opdyke 1979b)
Phenylacetaldehyde	25	Petrolatum	2	300	4	8	NA	1500	NA	NA	938		(Opdyke 1979b)
4-Phenylenediamine	24	Petrolatum	0.1	1000	14.5	21	NA	69	NA	NA	16.4	+	(Kligman 1966b)
4-Phenylenediamine	97	Petrolatum	0.01	500,000 ug	5	7.2	NA	NA	NA	10	6.9		(Marzulli and Maibach 1974)
4-Phenylenediamine	24	Petrolatum	10	1000	14.5	100	NA	6897	NA	NA	345		(Kligman 1966a)
4-Phenylenediamine	24	Petrolatum	0.2	1000	14.5	33	NA	138	NA	NA	21		(Kligman 1966a)
Phenylpropionaldehyde	7	Ethanol	2.5	500	6.45	14	NA	NA	NA	1938	692	+	(Akkan et al. 2003)
Potassium dichromate	23	Petrolatum	2	1000	14.5	100	NA	1379	NA	NA	69	+	(Kligman 1966a)
Potassium dichromate	25	Petrolatum	3	1000	14.5	72	NA	2069	NA	NA	144		(Kligman 1966b)
Potassium dichromate	21	Petrolatum	3	1000	14.5	86	NA	2069	NA	NA	120		(Kligman 1966b)
Propylene glycol	24	Petrolatum	25	1000	14.5	0	17241	NA	NA	NA	NA	-	(Kligman 1966a)
Propylene glycol	89	Petrolatum	60	500,000 ug	5	0	NA	NA	60000	NA	NA		(Marzulli and Maibach 1974)
Propylidene phthalate	25	Petrolatum	4	1000	14.5	12	NA	2759	NA	NA	1150	+	(Opdyke 1978)
Propylidene phthalate	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	945	NA	NA		(RIFM 2007)
Propylidene phthalate	NA	NA	NA	NA	NA	0	345	NA	NA	NA	NA		(RIFM 2007)
Pyridine	24	Petrolatum	50	1000	14.5	4.2	NA	34483	NA	NA	41051	+	(Kligman 1966a)
Resorcinol	22	Petrolatum	15	1000	14.5	0	10345	NA	NA	NA	NA	-	(Kligman 1966a)
Salicylic acid	25	Petrolatum	20	1000	14.5	0	13793	NA	NA	NA	NA	-	(Kligman 1966a)
Sodium lauryl sulfate	22	Petrolatum	10	1000	14.5	0	6897	NA	NA	NA	NA	-	(Kligman 1966a)

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Spearmint oil	NA	NA	4	NA	NA	0	NA	NA	NA	NA	NA	-	(Opdyke 1978)
Streptomycin	24	Petrolatum	0.1	1000	14.5	4.2	NA	69	NA	NA	82	+	(Kligman 1966b)
Streptomycin	23	Petrolatum	10	1000	14.5	65	NA	6897	NA	NA	769		(Kligman 1966b)
Streptomycin	23	Petrolatum	0.1	1000	14.5	13	NA	69	NA	NA	27		(Kligman 1966b)
Streptomycin	24	Petrolatum	10	1000	14.5	100	NA	6897	NA	NA	345		(Kligman 1966b)
Streptomycin	24	Petrolatum	5	1000	14.5	50	NA	3448	NA	NA	345		(Kligman 1966b)
Streptomycin	25	Petrolatum	25	1000	14.5	80	NA	17241	NA	NA	1078		(Kligman 1966a)
Sulfanilamide	25	Petrolatum	25	1000	14.5	20	NA	17241	NA	NA	4310		+
Sulfanilic acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	(Basketter et al. 1999a)
Tartaric acid	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	(Basketter et al. 1999a)
Tea leaf absolute	NA	NA	NA	NA	NA	0	NA	NA	480	NA	NA	-	(RIFM 2007)
Tetrachlorosalicylanilide	25	Petrolatum	0.1	1000	14.5	24	NA	69	NA	NA	14.4	+	(Kligman 1966b)
Tetrachlorosalicylanilide	25	Petrolatum	5	1000	14.5	88	NA	3448	NA	NA	195.9		(Kligman 1966a)
Tetrachlorosalicylanilide	25	Petrolatum	0.5	1000	14.5	26	NA	344.8	NA	NA	14.4		(Kligman 1966b)
Tetrachlorosalicylanilide	23	Petrolatum	0.05	1000	14.5	13	NA	34.5	NA	NA	13		(Kligman 1966b)
Tetramethylthiuram-disulfide	25	Petrolatum	25	1000	14.5	16	NA	17241	NA	NA	5388	+	(Kligman 1966a)
Tetramethylthiuram-disulfide	25	Petrolatum	10	1000	14.5	9	NA	6897	NA	NA	3832		(Kligman 1966b)
Tetramethylthiuram-disulfide	25	Petrolatum	10	1000	14.5	0	6897	NA	NA	NA	NA		(Kligman 1966b)
Thioglycerol	52	Water	1.23	500	4.23	11	NA	NA	NA	1454	661	+	(Voss 1958)
Thioglycerol	24	Petrolatum	50	1000	14.5	100	NA	34483	NA	NA	1724		(Kligman 1966a)
Thioglycerol	24	Petrolatum	20	1000	14.5	42	NA	13793	NA	NA	1642		(Kligman 1966b)
Treemoss	NA	EtOH or EtOH/DEP	NA	NA	NA	0	NA	NA	700	NA	NA	+	(RIFM 2007)
Treemoss	NA	NA	NA	NA	NA	0	6896	NA	NA	NA	NA		(RIFM 2007)
Treemoss	145	EtOH or EtOH/DEP	NA	NA	NA	2.07	NA	NA	NA	1417	3423		(RIFM 2007)
Tween 80	21	Petrolatum	25	1000	14.5	0	17241	NA	NA	NA	NA	-	(Kligman 1966a)

Test Substance	N	Vehicle	Conc (%)	Test Vol (µL)	Skin Area (cm ²)	Incid (%)	HMT		HRIPT		DSA ₀₅ (µg/cm ²)	Human Result	Reference
							NOEL (µg/cm ²)	LOEL (µg/cm ²)	NOEL (µg/cm ²)	LOEL (µg/cm ²)			
Xylene	24	Petrolatum	100	1000	14.5	0	68966	NA	NA	NA	NA	-	(Kligman 1966a)
Ylang Ylang	83	NA	NA	NA	NA	2.4	NA	NA	NA	7752	16150	+	(RIFM 2007)
Ylang Ylang	NA	NA	NA	NA	NA	0	6897	NA	1772	NA	NA		(RIFM 2007)
Zinc sulfate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-	(Basketter et al. 1999b)

Abbreviations: Conc = concentration; DEP = diethyl phthalate; DSA₀₅ = induction dose per skin area, in µg/cm², in a human repeat-insult patch test or human maximization test that produces a positive response in 5% of the tested population; EtOH = ethanol; HMT = human maximization test; HRIPT = human repeat-insult patch test; Incid = incidence; LOEL = lowest observed effect level; N = number of subjects tested; NA = not applicable; NOEL = no observed effect level; NR = not reported; PEG = polyethylene glycol; Vol = volume.

+ = An overall positive result was assigned if one or more human skin sensitization tests yielded a positive result.

- = An overall negative result was assigned only if all human skin sensitization tests yielded negative results.

References

- Akkan Z, Kalberlah F, Oltmans J, Schneider K. 2003. Beurteilung der Wirkstärke hautsensibilisierender Chemikalien anhand des Local Lymph Node Assay (LLNA). Dortmund, Germany: Auftrag der Bundesanstalt für Arbeitsschutz und Arbeitsmedizin.
- Basketter D, Gerberick GF, Kimber I. 2007. LLNA/EC3 Validation Submission.
- Basketter DA, Clapp C, Jefferies D, Safford B, Ryan CA, Gerberick F, et al. 2005. Predictive identification of human skin sensitization thresholds. *Contact Dermatitis* 53(5): 260-267.
- Basketter DA, Gerberick GF, Kimber I. 1998. Strategies for identifying false positive responses in predictive skin sensitization tests. *Food Chem Toxicol* 36(4): 327-333.
- Basketter DA, Lea LJ, Cooper K, Stocks J, Dickens A, Pate I, et al. 1999a. Threshold for classification as a skin sensitizer in the local lymph node assay: a statistical evaluation. *Food Chem Toxicol* 37(12): 1167-1174.
- Basketter DA, Lea LJ, Cooper KJ, Ryan CA, Gerberick GF, Dearman RJ, et al. 1999b. Identification of metal allergens in the local lymph node assay. *Am J Contact Dermat* 10(4): 207-212.
- Basketter DA, Rodford R, Kimber I, Smith I, Wahlberg JE. 1999c. Skin sensitization risk assessment: a comparative evaluation of 3 isothiazolinone biocides. *Contact Dermatitis* 40(3): 150-154.
- Cardin CW, Weaver JE, Bailey PT. 1986. Dose-response assessments of Kathon® biocide. (II) Threshold prophetic patch testing. *Contact Dermatitis* 15(1): 10-16.
- Cocchiara J, Api AM. 2005. A dermal safety evaluation of paratert-butyl-a methyl hydroxy cinnamaldehyde (BMHCA). *Toxicologist* 72(S1): 301.
- Danneman PJ, Booman KA, Dorsky J. 1983. Cinnamic aldehyde: a survey of consumer patch-test sensitization. *Food Chem Toxicol* 21(6): 721-725.
- De Groot AC, Weyland JW, Nater JP. 1994. *Unwanted Effects of Cosmetics and Drugs Used in Dermatology*. 3rd ed. Amsterdam:Elsevier.
- Ford RA, Api AM, Suskind RR. 1988. Allergic contact sensitization potential of hydroxycitronellal in humans. *Food Chem Toxicol* 26(11-12): 921-926.
- Friedmann PS, Moss C, Shuster S, Simpson JM. 1983. Quantitation of sensitization and responsiveness to dinitrochlorobenzene in normal subjects. *Br J Dermatol* 109(Suppl. 25): 86-88.
- Gad SC, Dunn BJ, Dobbs DW. 1986. Development and validation of an alternative dermal sensitization test: the mouse ear swelling test (MEST). *Toxicol Appl Pharmacol* 84(1): 93-114.
- Greif N. 1967. Cutaneous safety of fragrance material as measured by the maximization test. *American Perfumer and Cosmetics* 82: 54-57.

- Jordan WP, King SE. 1977. Delayed hypersensitivity in females. The development of allergic contact dermatitis in females during the comparison of two predictive patch tests. *Contact Dermatitis* 3(1): 19-26.
- Kligman AM. 1966a. The identification of contact allergens by human assay. 3. The maximization test: a procedure for screening and rating contact sensitizers. *J Invest Dermatol* 47(5): 393-409.
- Kligman AM. 1966b. The identification of contact allergens by human assay. II. Factors influencing the induction and measurement of allergic contact dermatitis. *J Invest Dermatol* 47(5): 375-392.
- Lalko J, Api AM. 2006. Investigation of the dermal sensitization potential of various essential oils in the local lymph node assay. *Food Chem Toxicol* 44(5): 739-746.
- Leyden JJ, Kligman AM. 1977. Contact sensitization to benzoyl peroxide. *Contact Dermatitis* 3(5): 273-275
- Malten KE, Van Ketel WG, Nater JP, Liem DH. 1984. Reactions in selected patients to 22 fragrance materials. *Contact Dermatitis* 11(1): 1-10.
- Marzulli FN, Maibach HI. 1974. The use of graded concentrations in studying skin sensitizers: experimental contact sensitization in man. *Food Cosmet Toxicol* 12(2): 219-227.
- Marzulli FN, Maibach HI. 1976. Contact allergy: predictive testing in man. *Contact Dermatitis* 2(1): 1-17.
- Marzulli FN, Maibach HI. 1980. Contact allergy: predictive testing of fragrance ingredients in humans by Draize and Maximization methods. *J Environ Pathol Toxicol* 3(5-6): 235-245.
- Nethercott JR. 1978. Skin problems associated with multifunctional acrylic monomers in ultraviolet curing inks. *Br J Dermatol* 98(5): 541-552.
- Nguyen LQ, Allen HB. 1979. Reactions to manganese and cadmium in tattoos. *Cutis* 23(1): 71-72.
- Opdyke DL. 1975a. Fragrance raw materials monographs. Clove bud oil. *Food Cosmet Toxicol* 13(6): 761-763.
- Opdyke DL. 1975b. Fragrance raw materials monographs. Clove stem oil. *Food Cosmet Toxicol* 13(6): 765-767.
- Opdyke DL. 1978. Fragrance raw materials monographs. Spearmint oil. *Food Cosmet Toxicol* 16(Supplement 1): 871-872.
- Opdyke DLJ. 1973. Monographs on fragrance raw materials. Benzylidene acetone. *Food Cosmet Toxicol* 11(6): 1021.
- Opdyke DLJ. 1974. Fragrance raw materials monographs. p-Methoxyacetophenone. *Food Chem Toxicol* 12: 927.
- Opdyke DLJ. 1976a. Fragrance raw materials monographs. 6-Methyl coumarin. *Food Chem Toxicol* 14: 605.
- Opdyke DLJ. 1976b. Fragrance raw materials monographs. Isopropyl myristate. *Food Cosmet Toxicol* 14: 323-325.
- Opdyke DLJ. 1979a. Fragrance raw materials monographs. alpha-Methylanisalacetone. *Food Chem Toxicol* 17: 863.
- Opdyke DLJ. 1979b. Fragrance raw materials monographs. Citral. *Food Chem Toxicol* 17: 259-266.

- Opdyke DLJ. 1982. Fragrance raw materials monographs. Acetyl isovaleryl. Food and Cosmetic Toxicology 20: 637.
- Poole RL, Griffith JF, MacMillan FS. 1970. Experimental contact sensitization with benzoyl peroxide. Arch Dermatol 102(4): 400-404.
- Rees JL, Friedmann PS, Matthews JNS. 1989. Sex differences in susceptibility to development of contact hypersensitivity to dinitrochlorobenzene (DNCB). Br J Dermatol 120(3): 371-374.
- RIFM. 2007. Data submission to NICEATM. Woodcliff Lake, NJ.
- Ryan CA, Gerberick GF, Cruse LW, Basketter DA, Lea L, Blaikie L, et al. 2000. Activity of human contact allergens in the murine local lymph node assay. Contact Dermatitis 43(2): 95-102.
- Rycroft RJ, Menné T, Frosch PJ, eds. 1993. Textbook of Contact Dermatitis. New York:Springer-Verlag.
- SCCNFP. 2003. Opinion concerning methylisothiazolinone. SCCNFP/0625/02. COLIPA.
- Steltenkamp RJ, Booman KA, Dorsky J. 1980. Cinnamic alcohol: a survey of consumer patch-test sensitization. Food Cosmet Toxicol 18(4): 419-424.
- Voss JG. 1958. Skin sensitization by mercaptans of low molecular weight. J Invest Dermatol 31(5): 273-279.

This page intentionally left blank