

Sodium α -Olefin Sulfonates

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Abstract

The Expert Panel for Cosmetic Ingredient Safety reviewed newly available studies since their original assessment in 1998, along with updated information regarding product types and concentrations of use, and confirmed that sodium α -olefin sulfonates are safe as cosmetic ingredients in the practices of use and concentration as described in this report.

Keywords

Sodium α -Olefin Sulfonates, Sodium C14-16 Olefin Sulfonate, Sodium C14-18 Olefin Sulfonate, Sodium C16-18 Olefin Sulfonate, Sodium C12-14 Olefin Sulfonate

In a 1998 safety assessment of sodium α -olefin sulfonates, the Expert Panel for Cosmetic Ingredient Safety stated that these ingredients are safe as (then) used in cosmetic products in rinse-off products and safe use was limited to 2% in leave-on products. Concentrations of the gamma sultone (a cyclic sulfonate ester) impurity of any formulations are limited to unsubstituted alkane sultones, ≤ 10 ppm; chlorosultones, ≤ 1 ppm; and unsaturated sultones, ≤ 10 ppm.¹ The Expert Panel reviewed newly available studies since that assessment, along with updated information regarding product types and concentrations of use, and did not reopen this safety assessment. The Panel confirmed that sodium α -olefin sulfonates are safe as cosmetic ingredients in the practices of use and concentration as given in Table 1 with the qualifications mentioned above.

The ingredients in this re-review are:

- Sodium C14-16 Olefin Sulfonate
- Sodium C12-14 Olefin Sulfonate
- Sodium C14-18 Olefin Sulfonate
- Sodium C16-18 Olefin Sulfonate

The new data reviewed by the Panel were collected from the European Chemicals Agency (ECHA) database in the form of robust summaries of studies on sodium C14-16 olefin sulfonate. Data were available on oral toxicity, reproductive and developmental toxicity, genotoxicity, carcinogenicity, irritation, and sensitization.^{2,3}

In 2013, data on ingredient usage are provided to the US Food and Drug Administration (FDA) Voluntary Cosmetic

Registration Program (VCRP; Table 1).⁴ A survey was conducted by the Personal Care Products Council (Council) of the maximum use concentrations for these ingredients also in 2013.⁵ Sodium C14-16 olefin sulfonate was reported to be used in 11 leave-on products, 247 rinse-off products, and 42 products that are diluted for bath. These include 6 baby products, 36 hair products, 1 lipstick, and 171 personal cleanliness products. Sodium C14-16 olefin sulfonate was reported to be used up to 13.2% in leave-on products, 19% in rinse-off products, and 10% in bath products. These include up to 10% in bubble baths and bath soaps and detergents, 19% in shampoos, and 13.2% in other personal cleanliness products. There were no concentrations of use reported for any baby products. Sodium C14-18 olefin sulfonate was reported to be used in 5 shampoos.³ Sodium C14-18 olefin sulfonate is used at concentrations up to 16% in shampoos. According to the VCRP, there were no reported uses for sodium C12-14 olefin sulfonate. The Council reported that sodium C12-14 olefin sulfonate is used up to 5%

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Table 1. Current and Historical Frequency and Concentration of Use of Sodium α -olefin Sulfonates According to Duration and Exposure.^{1,4-7}

	# of Uses		Max Conc of Use (%)		# of Uses		Max Conc of Use (%)	
	2013	1996	2013	1996	2013	1996	2013	1996
Sodium C14-16 Olefin Sulfonate					Sodium C14-18 Olefin Sulfonate			
Totals	300	93	.12-19	5-10	5	NR	NR	NR
Duration of Use								
Leave-On	9	2	1.2-13.2	10	NR	NR	NR	NR
Rinse-Off	247	66	.12-19	NR	5	NR	NR	NR
Diluted for (Bath) Use	42	25	2-10	NR	NR	NR	NR	NR
Exposure Type ^a								
Eye Area	NR	NR	NR	NR	NR	NR	NR	NR
Incidental Ingestion	1	NR	NR	NR	NR	NR	NR	NR
Incidental Inhalation-Spray	4	NR	NR	3.6 ^b	NR	NR	NR	NR
Incidental Inhalation-Powder	3	NR	NR	NR	NR	NR	NR	NR
Dermal Contact	260	64	.12-13.3	10	NR	NR	NR	NR
Deodorant (underarm)	NR	NR	NR	NR	NR	NR	NR	NR
Hair – Non-Coloring	35	28	.8-19	NR	5	NR	16	NR
Hair-Coloring	2	NR	4.5	NR	NR	NR	NR	NR
Nail	NR	1	NR	NR	NR	NR	NR	NR
Mucous Membrane	214	50	.12-13.2	NR	NR	NR	NR	NR
Baby Products	6	NR	NR	NR	NR	NR	NR	NR
Sodium C12-14 Olefin Sulfonate					Sodium C16-18 Olefin Sulfonate			
Totals	NR	NR	.28-5	NR	NR	NR	NR	NR
Duration of Use								
Leave-On	NR	NR	NR	NR	NR	NR	NR	NR
Rinse-Off	NR	NR	.28-5	NR	NR	NR	NR	NR
Diluted for (Bath) Use	NR	NR	NR	NR	NR	NR	NR	NR
Exposure Type ^a								
Eye Area	NR	NR	NR	NR	NR	NR	NR	NR
Incidental Ingestion	NR	NR	NR	NR	NR	NR	NR	NR
Incidental Inhalation-Spray	NR	NR	NR	NR	NR	NR	NR	NR
Incidental Inhalation-Powder	NR	NR	NR	NR	NR	NR	NR	NR
Dermal Contact	NR	NR	5	NR	NR	NR	NR	NR
Deodorant (underarm)	NR	NR	NR	NR	NR	NR	NR	NR
Hair – Non-Coloring	NR	NR	.28	NR	NR	NR	NR	NR
Hair-Coloring	NR	NR	.37	NR	NR	NR	NR	NR
Nail	NR	NR	NR	NR	NR	NR	NR	NR
Mucous Membrane	NR	NR	NR	NR	NR	NR	NR	NR
Baby Products	NR	NR	NR	NR	NR	NR	NR	NR

NR, no reported use.

^aBecause each ingredient may be used in cosmetics with multiple exposure types, the sum of all exposure types may not equal the sum of total uses.^bIt is possible these products are sprays, but it is not specified whether the reported uses are sprays.

in rinse-off products, including shampoos, hair tints, and skin cleansing preparations. There were no frequencies or concentrations of use reported for sodium C16-18 olefin sulfonate.

Author's Note

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