

# Sodium $\alpha$ -Olefin Sulfonates

Lillian C. Becker\*, Wilma F. Bergfeld\*\*, Donald V. Belsito\*\*, Ronald A. Hill\*\*\*, Curtis D. Klaassen\*\*, Daniel C. Liebler\*\*\*\*, James G. Marks\*\*\*\*, Ronald C. Shank\*\*\*\*, Thomas J. Slaga\*\*, Paul W. Snyder\*\*, Lillian J. Gill\*\*\*\*, Monice Fiume<sup>†</sup>, and Bart Heldreth<sup>‡</sup>

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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  $\alpha$ -olefin sulfonates are safe as cosmetic ingredients in the practices of use and concentration as described in this report.

## Keywords

Sodium  $\alpha$ -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  $\alpha$ -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,  $\leq 10$  ppm; chlorosultones,  $\leq 1$  ppm; and unsaturated sultones,  $\leq 10$  ppm.<sup>1</sup> 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  $\alpha$ -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.<sup>2,3</sup>

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

Registration Program (VCRP; [Table 1](#)).<sup>4</sup> A survey was conducted by the Personal Care Products Council (Council) of the maximum use concentrations for these ingredients also in 2013.<sup>5</sup> 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.<sup>3</sup> 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%

\*Cosmetic Ingredient Review Former Scientific Analyst/Writer

\*\*Expert Panel for Cosmetic Ingredient Safety Member

\*\*\*Expert Panel for Cosmetic Ingredient Safety Former Member

\*\*\*\*Cosmetic Ingredient Review Former Director

<sup>†</sup>Cosmetic Ingredient Review Senior Directory

<sup>‡</sup>Cosmetic Ingredient Review Executive Directory

## Corresponding Author:

Bart Heldreth, Executive Director, Cosmetic Ingredient Review, 1620 L Street, NW, Suite 1200, Washington, DC 20036, USA.

Email: [cirinfo@cir-safety.org](mailto:cirinfo@cir-safety.org)



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### References

1. Andersen FA. Final report on the safety assessment of sodium alpha-olefin sulfonates. *Int J Toxicol*. 1998;17(Suppl. 5):39-65.
2. European Chemicals Agency. *Sulfonic acids, C14-16 (even numbered)-alkane hydroxy and C14-16 (even numbered)-alkene, sodium salts*. <https://echa.europa.eu/.Date>. Accessed April 9, 2013.
3. Gottschalck TE, Breslawec HP. *International Cosmetic Ingredient Dictionary and Handbook*. 14 ed. Washington, DC: Personal Care Products Council; 2012.
4. Food and Drug Administration (FDA). *Frequency of Use of Cosmetic Ingredients*. *FDA Database*. Washington, DC: FDA; 2013.
5. Personal Care products Council. *Concentration of Use by FDA Product Category: Sodium Olefin Sulfonates*; 2013: 2 pages.
6. Food and Drug Administration (FDA). *Frequency of Use of Cosmetic Products*. Washington, DC; 1996.
7. Cosmetic Toiletry, and Fragrance Association (CTFA). *Use Levels for Various Ingredients*. Washington, DC; 1995: 2.