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# Allergic contact dermatitis caused by sodium cetearyl sulfate

Saioa Oscoz-Jaime<sup>1</sup>, Marcos Hervella-Garcés, Iñigo M. de Espronceda-Ezquerro and Juan I. Yanguas-Bayona

Dermatology Service, Complejo Hospitalario de Navarra, 31008 Pamplona, Spain

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Sodium cetearyl sulfate and other related alkyl sulfates are surfactants that are often used as emulsifiers in cosmetics, and to date they have been considered to be extremely rare sensitizers.

## Case Report

A 51-year-old atopic female with a past history of allergic contact dermatitis caused by methylchloroisothiazolinone/methylisothiazolinone in 2011 presented in our office in September 2016 with a 2-month history of eczematous lesions affecting predominantly the dorsal and lateral aspects of both hands and wrists. She admitted the use of multiple cosmetics. She was tested with a cosmetics and fragrances series (Chemotechnique Diagnostics, Vellinge, Sweden) and with her own products, according to the ESCD guideline (1); readings were performed according to ICDRG recommendations. On day (D) 4, +/++ positive reactions were detected to two of her own products (Neutrogena hand cream<sup>®</sup> and Neutrogena ultramoisturing foot cream<sup>®</sup>). The repeated open application test (ROAT) performed with the hand cream elicited a positive reaction within 3 days. Break-down of the creams was then performed, comprising 19 ingredients, supplied by the manufacturer (Johnson & Johnson, Los Angeles CA, USA). Further testing with individual ingredients yielded a ?+ reaction on D2 and a ++ reaction on D4 to sodium cetearyl sulfate (SCS), which was tested as provided by the manufacturer, at 10% pet. in Finn Chambers<sup>®</sup> (SmartPractice, Phoenix, AZ, USA), with 48 h of occlusion. Ten healthy controls showed no reactions to SCS. Cetyl alcohol 5%

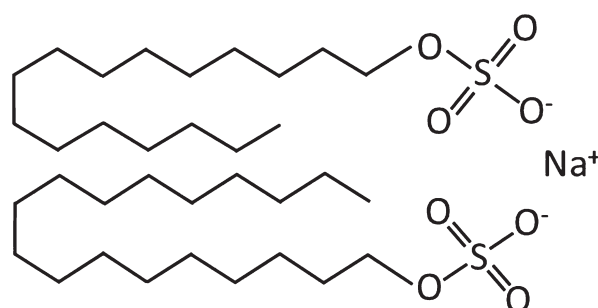


**Fig. 1.** Sodium cetearyl sulfate, also known as sodium cetyl/stearyl sulfate and sodium hexadecyl sulfate, octadecyl sulfate. Molecular formula:  $C_{34}H_{70}NaO_8S_2$ . Molecular weight: 694.

pet., stearyl alcohol 30% pet. and cetearyl alcohol 20% pet. were tested from the Chemotechnique cosmetics and leg ulcer series, and there were no reactions to any of them.

## Discussion

SCS (CAS no. 59186-41-3) is a sulfated salt of cetearyl alcohol (Fig. 1). Cetearyl alcohol is a fatty alcohol composed of the mix of a cetyl alcohol (hexadecanol) molecule and a stearyl alcohol (octadecanol) molecule. SCS is used in cosmetics mainly as an anionic emulsifier, because of its surfactant, emollient and opacifier properties. Its safety profile was tested twice, in 1992 and 2007, by the Cosmetic Ingredient Review Expert Panel. It was found in 111 products at concentrations of 0.1–10%. It was classified as a safe product for the skin: not irritant or sensitizing (2). It is thought that its 'safe profile' is related to the polyethoxylation of the fatty alcohols (3). To date, no cases of contact allergy to SCS have been reported, and only a few cases of allergic contact dermatitis caused by

Correspondence: Saioa Oscoz-Jaime, Dermatology Service, Complejo Hospitalario de Navarra, Irunlarrea Street, 3, 31008 Pamplona, Navarra, Spain. Tel: +34 615839530. Email: saioaoscoz@gmail.com

cetearyl alcohol (4) and cetearyl isonanoate (5) have been reported. Cetearyl alcohol is an unusual allergen in cosmetics (6) but a rather frequent allergen in topical pharmaceutical products (7).

This is the first reported case of allergic contact dermatitis caused by SCS confirmed by patch testing, a ROAT, clinical improvement after cessation of the use of the cream, and negative test results in 10 healthy controls.

We strongly recommend testing each ingredient individually in every case of suspicion of allergic contact dermatitis caused by cosmetics, in order to detect new contact allergies to 'safe' molecules.

### Conflicts of Interest

There are no conflicts of interest to be declared.

### References

- 1 Johansen JD, Aalto-Korte K, Agner T et al. European Society of Contact Dermatitis guideline for diagnostic patch testing – recommendations on best practice. *Contact Dermatitis* 2015; **73**: 195–221.
- 2 Fiume M, Bergfeld W F, Belsito D V et al. Final report on the safety assessment of sodium cetaryl sulphate and related alkyl sulfates as used in cosmetics. *Int J Toxicol* 2010; **29**: 115S–132S.
- 3 Corazza M, Zauli S, Bianchi A et al. Contact dermatitis caused by fatty alcohols: may polyethoxylation of the fatty alcohols influence their sensitizing potential? *Contact Dermatitis* 2013; **68**: 189–190.
- 4 Armengot-Carbo M A, Rodríguez-Serna M, Taberner-Bonastre P, Miquel-Miquel J. Allergic contact dermatitis from cetearyl alcohol in Thrombocid ointment. *Dermatol Online J* 2016; **15**: 22.
- 5 Sarre M E, Mancel E, Drouet M, Avenel-Audran M J. Allergic contact dermatitis caused by cetearyl isononanoate in a sunscreen product. *Contact Dermatitis* 2017; **76**: 357–358.
- 6 Kieć-Świerczyńska M, Kręcis B, Świerczyńska-Machura D. Photoallergic and allergic reaction to 2-hydroxy-4-methoxybenzophenone (sunscreen) and allergy to cetyl alcohol in cosmetic cream. *Contact Dermatitis* 2005; **53**: 170–171.
- 7 Goossens R A. Allergic contact dermatitis from the vehicle components of topical pharmaceutical products. *Immunol Allergy Clin North Am* 2014; **34**: 663–670.