

Accepted Manuscript

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PII: S0001-8686(17)30525-0
DOI: doi:[10.1016/j.cis.2018.04.002](https://doi.org/10.1016/j.cis.2018.04.002)
Reference: CIS 1874

To appear in: *Advances in Colloid and Interface Science*



Please cite this article as: Artur Seweryn , Interactions between surfactants and the skin – Theory and practice. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Cis(2017), doi:[10.1016/j.cis.2018.04.002](https://doi.org/10.1016/j.cis.2018.04.002)

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Interactions between surfactants and the skin – theory and practice

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Keywords: surfactants, skin irritation, anti-irritants, cosmetics, household products

Abstract

One of the primary causes of skin irritation is the use of body wash cosmetics and household chemicals, since they are in direct contact with the skin, and they are widely available and frequently used. The main ingredients of products of this type are surfactants, which may have diverse effects on the skin. The skin irritation potential of surfactants is determined by their chemical and physical properties resulting from their structure, and specific interactions with the skin. Surfactants are capable of interacting both with proteins and lipids in the stratum corneum. By penetrating through this layer, surfactants are also able to affect living cells in deeper regions of the skin. Further skin penetration may result in damage to cell membranes and structural components of keratinocytes, releasing proinflammatory mediators. By causing irreversible changes in cell structure, surfactants can often lead to their death. The paper presents a critical review of literature on the effects of surfactants on the skin. Aspects discussed in the paper include the skin irritation potential of surfactants, mechanisms underlying interactions between compounds of this type and the skin which have been proposed over the years, and verified methods of reducing the skin irritation potential of surfactant compounds. Basic research conducted in this field over many years translate into practical applications of surfactants in the cosmetic and household chemical industries. This aspect is also emphasized in the present study.

Declarations of interest: none

1 Introduction

Every day the skin is exposed to aggressive factors that can cause cutaneous irritation. In addition to chemical compounds affecting the skin through direct contact, the condition of the skin also depends on physical, biological and environmental factors [1, 2]. Some of them may act simultaneously, thus potentiating the effect produced by individual factors. Examples include household chemicals containing abrasive ingredients or cosmetic scrubs. Abrasive

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