



LEBENSMITTELCHEMISCHE GESELLSCHAFT

- Fachgruppe in der GESELLSCHAFT DEUTSCHER CHEMIKER -
Arbeitsgruppe Kosmetische Mittel

Data sheets for the evaluation of the effectiveness of active ingredients in cosmetic products

Urea

Definition

Raw material		INCI name	CAS No.	EINECS/ELINCS number
Urea		Urea	57-13-6	200-315-5

Application as a cosmetic active ingredient

The natural moisturising factors of the skin horny layer consists of 7 % urea. Urea is a component of sweat and is formed during the cornification process (arginine degradation) [1]. The following table [2] gives an overview of the various cosmetic effects of urea depending on the urea concentration in the product:

Concentration range [%]	Effects
1 – 3	Hydration, moisturiser
5 – 10	Strong hydration, desquamation, preservative-saving effect due to a weak antimicrobial effect
5 - 20	Excipient effect

Urea is used for cosmetic skin care because of its excellent moisturising effect. The external application of urea containing products increases the water content of the horny layer ("moisturiser effect") for hours. Urea is often used in combination with other moisturising agents. If it is used as the only moisturising substance, its concentration is usually between 1-10%.

Studies by Schrader have shown that a concentration of at least 3% is required for urea to have a significant moisturising effect and at least 10% for a significant anti-dandruff effect. [10]. The current CIR report "Safety Assessment of Urea" [11] indicates that the industry uses urea, possibly together with other active ingredients, in the concentration range of just 0.1% as a moisture-enriching agent. In terms of skin compatibility and the hydrating effects of urea, the formulation plays a key role. It takes slightly longer to develop the moisturising effect when using W/O emulsions versus O/W emulsions, but the moisture-binding effect of W/O emulsions lasts longer because deeper parts of the horny layer are reached [2, 7, 8, 9].

For skin care targeted at aged and dry skin, O/W emulsions with around 2% urea and W/O emulsions with around 4% urea are frequently used [2].

Use as an additive

Due to its structure, urea is able to form clathrates as well as water-soluble adducts with various other substances. As a result of this latter property, the so called 'additive-effect', urea is used mainly to increase the skin penetration of drugs in pharmaceutical composition. [2, 12].

Note: The general notes and recommendations in this data sheet series are to be respected along with the legal standards currently in force.

- Literature:**
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