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## **Mildness and Applications of Alkyl Polyglucoside in Personal and Home Care Products**

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This is a technical presentation for Poster on Alkyl Polyglucoside which is a 100% renewable surfactant.

In recent years, consumers are increasingly concerned with environmental, safety, societal, and personal well-being impacts of products they buy as the environmental issues are increasing in worldwide, like global warming, decreasing rain forests, air pollution, desertification, extermination of various animals and plants, etc. This trend that we named "Ecoethics" comprises ecological concern with an ethical dimension, and is gaining higher momentum. And there are a lot of concepts like, Hybrid, Organics, Natural, Eco Chic, Sustainable, Ecolabelled, Green, Earth Friendly, etc. in a whole society. Due to this trend, the market for "green" solutions also in the personal and home care segment as well as in the I&I market is growing rapidly. Namely, "Greening" is a global key mainstream.

Alkyl Polyglucoside, which is a 100% natural, renewable, plant-derived surfactant, is a very strong tool to support "Greening" trend in Personal and Home Care Products. Because it is prepared from glucose and vegetable fatty alcohol and it shows higher performance as a main or co surfactant with excellent ecological property.

To evaluate the relative irritation potential, HET-CAM, RBC and ECT were done to compare Decyl Glucoside with other surfactants typically used in personal care applications widely (Table 3.). Decyl Glucoside showed a lower irritation potential clearly than other anionic and amphoteric surfactants on ocular/mucous membrane (HET-CAM, RBC) and dermal irritation (ECT) tests. In dermal irritation test, only disodium laureth sulfosuccinate showed less skin irritation than Decyl Glucoside.

The cumulative irritation potential of surfactants with the soap chamber test

was compared on Dryness and Transepidermal water loss (TEWL). The surfactants can remove lipids from the skin during the washing process. This can result in dryness and roughness of the skin. In addition, due to the damage to the lipid barrier, an increase in TEWL is usually observed. But in the case of Decyl Glucoside, it showed very low irritation potential also on dryness and TEWL, which the values of it were similar to that only with water.

ECT and RBC assessments with body wash and shampoo formulations were done and compared with typical market products. Decyl glucoside showed also low irritation potential than other surfactants when it was formulated in the various applications.

In terms of surface active property, Foaming property, Emulsifying potential, Soil remover property, and other skin compatibility with various alkyl polyglucoside were measured and compared with other typical surfactants. And plastic compatibility, filming property, and anti-streaking property of them were also measured on the hard surface.

As a summary, Alkyl Polyglucoside is very mild to human skin, and shows very good environmental compatibility and higher performance on every application in Personal and Home Care Products. Alkyl Polyglucoside can be regarded as the ideal “green” surfactants which add value to the formulated products and help to distinguish these products from conventional ones.

**Table 3. Irritant potential of the tested surfactants in three ocular/mucous membrane and dermal irritation tests (HET, RBC, ECT) and two cumulative irritation tests (dryness, TEWL). For each test, higher numbers indicate higher irritancy potential, except for RBC where the reverse is true.**

	Ocular/Mucous Membrane and Dermal Irritation Tests			Soap Chamber Tests <sup>a</sup> for Cumulative Irritation	
	HET (Q) <sup>b</sup>	RBC (H <sub>50</sub> /DI)	ECT (%) <sup>c</sup>	Dryness (d8) (mean values)	TEWL <sup>d</sup> (d8) (g/m <sup>2</sup> /hr)
Decyl glucoside	0.59	342.76	6.1	0.05	9.32
Disodium laureth sulfosuccinate	0.72	2.66	5.1	0.09	11.92
Disodium cocoamodiacetate	0.63	7.77	14.1	0.00	10.49
Cocamidopropyl betaine	2.05	7.87	13.5	0.32	11.82
Sodium lauryl sulfate	2.59	0.22	104.3	3.86	27.44
Sodium laureth sulfate	1.56	0.17	58.0	1.35	16.04
Ammonium lauryl sulfate	3.02	0.14	82.0	3.68	19.16
Disodium cocoyl glutamate	1.16	23.68	9.4	0.12	11.31
Sodium lauryl sulfate, 0.2%	-	-	-	2.55	24.50
Water (aqua)	-	-	-	0.07	9.00

<sup>a</sup> For soap chamber tests the positive control SLS was tested at 0.2% AS content. All other test materials were tested at 1% AS content.  
<sup>b</sup> Irritation Index relative to 5% AS Texapon ASV 50 (INCI: Sodium laureth sulfate (and) sodium laureth 8-sulfate (and) magnesium laureth sulfate (and) magnesium laureth 8-sulfate (and) sodium oleth sulfate (and) magnesium oleth sulfate), a product of Cognis GmbH  
<sup>c</sup> Total irritation score relative to 0.5% sodium lauryl sulfate (analysis grade)  
<sup>d</sup> TEWL adjusted to baseline