



Commentary

Opinion of the Scientific Committee on consumer safety (SCCS) - Opinion on the use of 2,2'-methylene-bis-(6-(2H-benzotriazol-2-yl)- 4-(1,1,3,3-tetramethylbutyl)phenol) (nano) – S79 – In cosmetic products



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nano

MBBT

Regulation 1223/2009

CAS 103597-45-1

EC 403-800-1

The substance 2,2'-methylene-bis-(6(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol) (MBBT) (CAS No 103597-45-1), Methylene bis-benzotriazolyl tetramethylbutylphenol (INCI) (COLIPA S79) is currently regulated in Entry 23 Annex VI of the Cosmetics Regulation (EC) 1223/2009 with the maximum concentration of 10% in cosmetic products such as sunscreens, day care products and skin lightening products. The safety of mentioned use conditions was confirmed by the Scientific Committee on Cosmetic Products and Non-Food (SCCNFP) in 1998 following submission I by COLIPA² (SCCNFP/0080/98).³

Submission II on MBBT was submitted to the Scientific Committee on Consumer Safety (SCCS) in January 2013 to assess the

safety of its nano form. The SCCS opinion concluded that:

“Since no appropriate data on genotoxicity of nano form of MBBT were provided, no conclusion on the safety of this substance can be drawn. However regarding systemic effects there seems no concern for the dermal application of nano-sized MBBT” (SCCS/1460/11).⁴

In August 2014 the applicant has transmitted a new safety dossier that summarizes analytical and toxicological results obtained for genotoxicity studies performed with nano and non-nano forms of MBBT.

The calculation for margin of safety in this Opinion is based on a 39-week dermal toxicity study in the mini-pig, as no repeated dose toxicity study with the nano-sized material is available in rats. Also, dermal penetration data are not available for mini-pig skin. The SCCS has based this Opinion on the overall weight of evidence that suggests a very low absorption of MBBT in human skin, and the lack of adverse effects in mini-pigs up to the highest dose tested (1000 mg a.i./kg bw/day) over 39 weeks. These together indicate that dermal application of nano-sized MBBT with regard to systemic effects is not a safety concern. The SCCS has therefore concluded that the use of MBBT [2,2'-methylene-bis-(6(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol)] in nano-structured form with the following characteristics as a UV-filter at a concentration up to 10% in dermally applied cosmetic products is considered to not pose a risk of adverse effects in humans after application on healthy, intact skin:

The material has a purity of $\geq 98.5\%$ with the isomer fraction not exceeding 1.5%, and the impurity profile not significantly different from that indicated in section 3.1.5.

The material has a median particle size ($d_{0.5}$) of 120 nm or larger in terms of mass distribution, and/or 60 nm or larger in terms of number size distribution (by laser diffraction).

The material complies with other physicochemical specifications of the evaluated material as listed under section 3.1 of this

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² COLIPA - now Cosmetics Europe, - European Cosmetics Toiletry and Perfumery Association.

³ http://ec.europa.eu/health/scientific_committees/consumer_safety/opinions/sccnfp_opinions_97_04/sccp_out73_en.htm.

⁴ http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccso129.pdf.

opinion in terms of chemical identity, physical form, chemical composition, solubility, zeta potential, etc.

In view of the limited available information on inhalation toxicity, which indicates severe inflammatory effects of microfine MBBT in the respiratory tract, caution is warranted against the use of the material in applications that could lead to exposure of the consumer's lungs by inhalation. This Opinion therefore does not apply to such applications that might lead to exposure of the consumer's lungs to MBBT nanoparticles by inhalation.

It should also be noted that this Opinion is based on the currently available scientific evidence, which shows an overall very low dermal absorption of MBBT in nano- or larger particle forms. If any new evidence emerges in the future to show that the nano-form of MBBT used in cosmetic products can penetrate skin (healthy, compromised, sunburnt or damaged skin) in any significant amounts to reach viable cells, the SCCS may consider revising this assessment.

The *in vitro* genotoxicity assessment of MBBT was negative in two different test systems. These tests were appropriately applied and demonstrate that there was no evidence for chromosomal damage or mutagenicity when mammalian cells were exposed to both non-micronised and nano-forms of MBBT. Although these test data are accepted by the SCCS, no experimental data on uptake/internalisation of the particle by cells has been provided.

In addition, the SCCS has the following concerns:

- In the study in rats, clinical effects (pain and vocalisation) after dermal application were noted at concentrations of 20% (500 mg a.i./kg bw/d and higher). In the carcinogenicity study, scabs were seen at a dose level of 100 mg a.i./kg/bw/day and higher. It is worthwhile to monitor possible irritation effects via the cos-metovigilance programs.
- Given the physicochemical properties (high lipophilicity) of the substance, potential bioaccumulation in selected tissues is of concern, especially over long-term use.

This opinion does not address the effects of MBBT on the environment.

Transparency document

Transparency document related to this article can be found online at <http://dx.doi.org/10.1016/j.yrtph.2016.01.002>

Reference

http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_168.pdf.