

## UV-filters in cosmetics – prioritisation for environmental assessment

### Science Summary

By searching various sources of chemical information, Environment Agency-sponsored researchers have identified 10 UV-filters that are a high priority for further environmental assessment. They suggest that EU member states may wish to nominate some or all of these substances for evaluation under the new EU REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) regulation.

UV-filters are used in a wide range of products, including plastics, rubber, cosmetics and sunscreens. Their function is to provide protection against the damage that can be caused by the ultraviolet (UV) component of sunlight, such as bleaching and sunburn.

However, recent research has suggested that some of these substances are able to interfere with the endocrine systems of a wide range of organisms, affecting their ability to reproduce. Given the ubiquity of UV-filters in society and the ease with which they can enter the environment, the Environment Agency commissioned a screening project to identify whether any of these substances might be priorities for a more in-depth environmental hazard or risk assessment.

The researchers began by drawing up a list of commercially-available UV-filters, based primarily on European legislation that details all the UV-filters that have been authorised for use in cosmetic sunscreen products in the EU. To this list, they also added UV-filters mentioned in the International Nomenclature of Cosmetics Ingredients, as well as those found from a general search of the internet. In this way, the researchers were able to produce a list of 41 different UV-filters.

They then consulted various chemical databases, as well as safety data sheets, to obtain information on the chemical properties and toxicity of each of these UV-filters, as well as whether they were produced at high or low volumes. For those substances where this information wasn't available, the researchers estimated chemical properties such as water solubility and aquatic toxicity from their chemical structure.

Using this information, together with general estimates for the emission of UV-filters to the environment from their production, formulation and use, the researchers were able to determine the predicted environmental concentration for each substance and whether this concentration posed a potential risk. They could also determine whether the substances might potentially be classified as persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB).

Finally, by conducting a literature review, they were also able to identify which of the UV-filters possessed apparent endocrine disrupting properties.

The researchers found that four of the 41 UV-filters met every one of these criteria, being potentially present in the environment at risky concentrations, and PBT or vPvB, and potential endocrine disrupters. These four substances were thus identified as the highest priority for more detailed hazard and risk assessment; six other substances met some but not all of the criteria and were therefore identified as a slightly lower priority. The four high priority substances were: homosalate; 4-methylbenzylidene camphor; 3-benzylidene camphor; and ethylhexyl dimethyl PABA.

This report of the screening project contains detailed entries for each of the 41 UV-filters, including information on their chemical properties, toxicity and predicted environmental concentrations. It also summarises the findings of some of the main scientific studies into their endocrine disruption potential.

**This summary relates to information from the Science Project: 'UV-filters in cosmetics – prioritisation for environmental assessment' reported in detail in the following output(s):-**

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