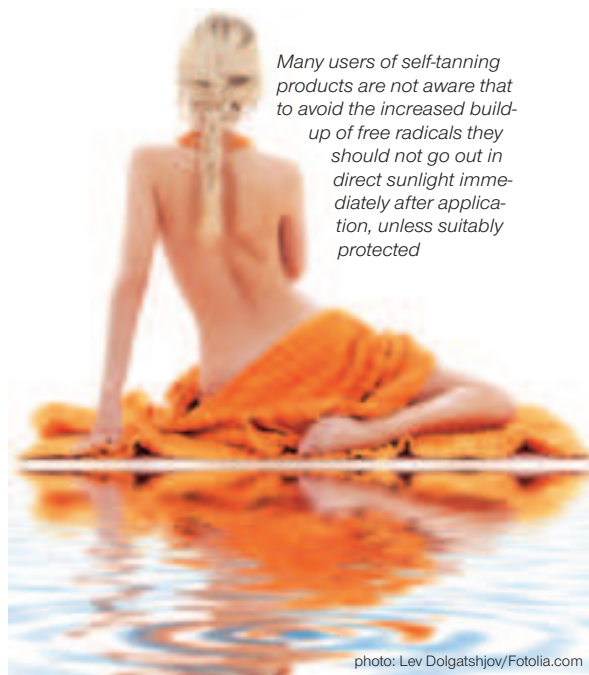


Avoiding free radicals during the self-tanning process

UV-A filter with a dual action

Consumers expect a “healthy tan” from self-tanning products, i.e. beautifully bronzed skin without the negative effects of sunbathing. Recent studies have shown however that the number of free radicals is dramatically increased if, after applying a self-tanner, the user goes out into sunlight. COSSMA editor Angelika Meiss asked Dr. Heike Flösser-Müller of BASF how this problem can be solved.



Many users of self-tanning products are not aware that to avoid the increased build-up of free radicals they should not go out in direct sunlight immediately after application, unless suitably protected

photo: Lev Dolgatsjov/Fotolia.com

What happens when you are exposed to sunlight directly after using a self-tanner?



Dr. Heike Flösser-Müller, Technical Manager Personal Care Ingredients Europe at BASF: During the self-tanning process the sugar-like active substance dihydroxyacetone, and also erythulose, behave in a way similar to sugars when one bakes a cake. They react with proteins in the outermost, dead layer of the skin to produce brown polymeric pigments – the melanoidins. This chemical reaction (the Maillard reaction) takes place via radical intermediates. UV radiation, in particular in the UV-A range, also induces the formation of free radicals in the skin. If both reactions now come together, i.e. if the user is using a self-tanner and goes out into normal daylight, there is a real explosion of radicals in the skin.

And what can be done about it?

There are various possibilities. One can apply self-tanner in the evening, or stay indoors for the first few hours after application. Even then, one should

take care not to stay too close to a window because a window will allow a large percentage of UV-A light to pass through. After a few hours the tanning reaction will have been completed and the number of free radicals will have returned to a normal level. The second possibility, which we examined as part of our study, is the use of effective UV filters.

Which UV filters did you look into?

The self-tanners currently on the market are designed such that they either target only the tanning effect, or they offer some protection against sunburn using a UV-B filter.

So we focussed our research on the UV-B filters Uvinul MC80 and Uvinul T150 and the UV-A filter Uvinul A Plus, as well as a combination of both filter types. With the UV-B filters we achieved a measurable, but by no means satisfactory, effect. They were able to slightly reduce the “radical explosion” but certainly not prevent it.

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And what were the results of your tests with the UV-A filter Uvinul A Plus?

We observed that Uvinul A Plus affords the best protection, and also has a dual effect. When using a self-tanning product that contains only this photo-stable UV filter there was not only a reduction in the number of free radicals down to a normal level, but the protection went further: the number of induced free radicals was, from the beginning, considerably lower, and with it the risk of light-induced skin damage. Self-tanning products are therefore ideally used together with the UV-A filter Uvinul A Plus in order to protect against free radicals. Of importance here is not only the efficiency of the UV-A filter but also its photo-stability, without which it could break down and produce free radicals itself. ■

* A literature list and suggested formulations can be found on the Internet (see Internet button)

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VIP of the Month

Dr. Heike Flösser-Müller
of BASF explains how
to avoid free radical
build-up during the
self-tanning process