

Periodic Graphics

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A collaboration between C&EN and
Andy Brunning, author of the popular
graphics blog *Compound Interest*

Cosmetic chemical concerns



Some families of chemicals in personal care products cause concerns. Here we examine some of these ingredients' roles and why in some cases manufacturers are looking for alternatives.



Cosmetic ingredient roles

Dyes or pigments	Color cosmetics
Emollients	Prevent water loss from the skin
Emulsifiers	Stop ingredients from separating
Fragrances	Improve the smell of cosmetic products
pH stabilizers	Adjust the acidity of cosmetics
Preservatives	Prevent the growth of microorganisms
Solvents	Dissolve other ingredients.
Thickeners	Increase the viscosity of cosmetics

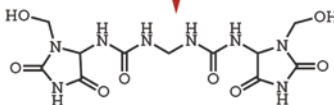
Formaldehyde releasers

Preservatives



Formaldehyde releasers slowly generate the preservative formaldehyde. Though the levels of formaldehyde these compounds release are low, they can still cause an allergic response in sensitized people.

Imidazolidinyl urea

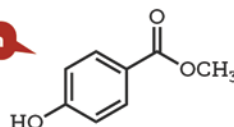
 Formaldehyde releaser

Parabens

Preservatives

Parabens are among the most effective preservatives but may mimic the hormone estrogen. The European Union restricts some parabens in cosmetics because of a lack of data from which to evaluate human risk. Regulators consider commonly used parabens, such as methylparaben, safe at typical cosmetic levels.

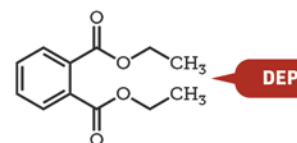
Methylparaben



Phthalates

Solvents and fragrance prolongers

Some phthalate esters may interfere with hormones and may have reproductive toxicity. Diethyl phthalate (DEP), used in some cosmetics, has less toxicity than longer-chain phthalate esters and is safe at the concentrations used.



Silicones

Emollients and thickeners

Silicones in cosmetics include dimethicone and decamethylcyclopentasiloxane (D₅). The EU has limited the use of some cyclic silicones, including D₅, in cosmetic products because of concerns about their accumulation in the environment.

