

# Advice to the Lab Lorn

"Advice to the Lab Lorn" is intended to offer advice, or maybe just solace, for confusing, challenging or downright murderous issues facing SCC members in their labs. Send us your questions at [lablorn@caliscc.org](mailto:lablorn@caliscc.org) and we'll track down an authority or two and get back to you in the Cosmegram. You can include your name if you wish, but we won't publish it for all to see! Your secrets are safe with us.

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In response to consumer objections to parabens, our marketing department has asked those of us in R&D to remove these ingredients from our products. We expressed caution in doing so, but they are insisting we investigate alternatives. Do you have any suggestions to help us with this process?

**A:** Parabens are the most commonly used preservatives in cosmetics and personal care products and have enjoyed widespread use in foods and pharmaceuticals as well. They are also the most studied of all commonly used preservatives, in part due to their use in injectable drugs. Yet, the controversy surrounding the use of parabens in personal care products is on the rise, in part to studies published in various journals concerning their ability to weakly mimic estrogen (Byford, et al. *Journal of Steroid Biochemistry & Molecular Biology*. 80(1):49-60, 2002 Jan.) as well as a study which linked parabens to breast cancer tumors (Darbre et al. *Journal of Applied Toxicology*. 23(1):43-51, 2003 Jan-Feb). The Darbre study has generally stirred the most emotion on this subject and while most industry experts agree that the study was incomplete, highly flawed and made no direct link between parabens and cancer, the safety of parabens has been questioned. This perception has led some formulators to seek alternatives to these preservatives.

While parabens demonstrate only low practical effectiveness in preventing the growth of most bacterial contaminations, they are much more efficacious for controlling yeast and mold growth. As such, their replacement is not necessarily an easy task, especially if one wishes to market a "globally acceptable" product formula. This criterion would eliminate the use of formaldehyde-donor preservatives, which are highly effective against bacteria, yeast and mold.

There have been a number of raw material suppliers that have offered some alternatives to paraben-based preservative systems. Many paraben-free preservative systems are based in part on the use of phenoxyethanol in addition to other actives, which may include caprylyl glycol, pentylene glycol, hexylene glycol, chlorphenesin, and organic acids such as dehydroacetic acid, benzoic acid, sorbic acid or their salts, sodium dehydroacetate, sodium benzoate and potassium sorbate. Other preservatives of interest may include a novel glycerin derivative, ethylhexylglycerin and natural essential oils such as cinnamon leaf oil, rosemary oil and thyme oil. One can also include, with some limitations, the use of thiazolinone derivatives, which include methylisothiazolinone, either alone or in combination with methylchloroisothiazolinone.

Formulators need to carefully consider other aspects of their formulations and ingredients before they embark on the use of these alternative preservative systems. These considerations should include effective use levels, safety, compatibility, pH, cost considerations and consumer acceptance.

Lastly, any preservative system needs to be carefully tested to insure that it is stable and does not interact with other ingredients in the formula or other conditions of storage and use. A "preservative effectiveness" test with all new systems is an absolute necessity to insure that the system will protect against common organisms and those more "adapted organisms" such as might be encountered in the manufacturing environment, when the product is compounded and filled.

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