

Advice to the Lab Lorn

"Advice to the Lab Lorn" is a new column in the Cosmogram 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 and we'll track down an authority or two and get back to you in the Cosmogram. You can include your name if you wish, but we won't publish it for all to see! Your secrets are safe with us.

John Garruto & Rebecca James Gadberry

2. How do you preserve a lotion?

- A. The question may seem rather simple, however the answer to this question involves a number of issues. The "ideal" preservative must have broad-spectrum activity, with the ability to control not only Gram-Positive and Gram-Negative bacteria, but also yeast and mold. This may require a preservative "cocktail" rather than a single material. It must be compatible with other formula ingredients, conditions of pH and the rigors of the manufacturing process. For instance the use of formaldehyde-based preservatives in formulations containing dihydroxyacetone or avobenzone is not advised. The preservatives must also be safe and non-irritating, as used.

Additionally, one must consider where the product will be marketed and whether the regulations in the country of anticipated sale prohibit or greatly limit the use of certain preservatives. Certainly this is the case with so called "fomaldehyde donors" in Japan and elsewhere. This product is a lotion and presumably, it is intended to be left on the skin. In this case, one must be aware of restrictions for "leave-on" products, especially with the isothiazolinones.

The solubility of the preservative is also of great importance. The preservative should have good water solubility, as most contamination problems are associated with water or water-based ingredients, contained within the formula. The addition of as much of the preservative as is practical, in the water phase is advisable. If a preservative has water and oil solubility, as is the case with phenoxyethanol and its combination products, it may be a good strategy to add a small portion of the preservative to the oil phase. This may help to protect the product from contamination at the water-oil interface.

Another good approach is to utilize materials in the formulation that help to support the preservative system and lower the "activity" of the water. The use of chelating agents such as EDTA and its salts can be very effective as a synergist at low concentrations. EDTA thus acts as a potentiator for preservatives, increasing their antimicrobial activity. Also, polyols such as glycerin, propylene, butylene or pentylene glycol or cationic surfactants can act as additional "hurdles" for microorganisms. The formula pH can be helpful in providing protection. This may mean buffering the pH at slightly below a pH of 5.0, or lower for an AHA product.

Finally, the product formulation should undergo Preservative Efficacy Testing (PET) to establish the integrity of the preservative system and its ability to withstand contamination at the manufacturing site or by the consumer. A USP or CTFA test method is acceptable, if protective packaging is used; however more stringent criteria are recommended for customary, multiple-use products.

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