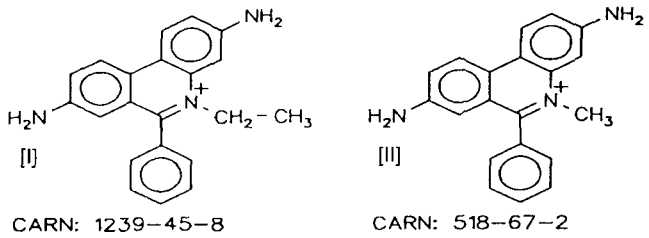
Does the Two-Phase Titration of Surfactants Require a Mutagenic Indicator?

Sir:

For the two-phase titration of anionic or cationic surfactants, the most frequently used system is a mixed indicator system consisting of dimidium bromide and disulfine blue (1). Recently, we noticed a similarity between ethidium bromide [I] and dimidium bromide [II]. [I] is well known as a strong mutagenic agent, whereas [II], up to now, has not been regarded as a hazardous chemical (see Scheme 1 where CARN is Chemical Abstracts Registry Number).



SCHEME 1

The literature (2–4) shows that [II] reacts with DNA in a similar way to [I], either by an external binding mode or by intercalation. When mixing aqueous solutions of DNA and [II], a change in the color of the solution can be observed, as well as a strong enhancement in the fluorescence intensity (A. Lezius, personal communication). These findings make it likely that dimidium bromide shows mutagenic properties that are similar to those of ethidium bromide. For that reason, the appropriate safety precautions should be taken when working with dimidium bromide.

When titrating anionic surfactants, dimidium bromide will be found in the aqueous phase at the end of the titration. The dye should be removed from the solution by adsorption on activated charcoal, which must be disposed of according to legal regulations.

REFERENCES

1. Schmitt, Th.M., *Analysis of Surfactants*, M. Dekker, Inc., New York, 1992.
2. Lerman, L.S., *J. Cell and Comp. Physiol. 64*:1, 1 (1964).
3. Wakelin, L.P.G., and M.J. Waring *Molec. Pharmacol. 9*:544 (1974).
4. Dougherty, G., *Int. J. Biochem. 14*:493 (1982).

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