The effect of cosolvents on the sensitivity of benzocaine in aqueous solution to ionizing radiation

G. FLETCHER AND D. J. G. DAVIES

School of Pharmacy and Pharmacology, University of Bath, Bath, U.K.

Pharmaceuticals in aqueous solution are more susceptible to irradiation than in non-aqueous systems, because the highly radiolytic products of water ($H\cdot$, e^-_{aq}, $OH\cdot$, H_2 and H_2O_2) are capable of inducing chemical changes. Because of the decreased amount of water in such topical preparations as creams and the desirability of presenting them sterile we have begun an investigation into the feasibility of sterilizing creams by ionizing radiation, recognizing that the association of the drug with the surfacant micelles and the presence of stabilizers, cosolvents or other adjuvants may afford protection to the drug. This communication reports the effect of cosolvents on the sensitivity of benzocaine to gamma radiation.

2 ml of $1{\cdot}25 \times 10^{-4}$ M benzocaine in water-cosolvent mixtures were irradiated in a ^{60}Co source. The water-cosolvent mixtures investigated were ethanol in water (10, 20, 40% w/v) glycerol in water (5, 20% w/v) and polyethylene glycol 200 in water (5, 10, 40 % v/v) and the distilled water used was saturated with oxygen by bubbling O_2 through the water for 1 h before use. Following irradiation, 1 ml of each of the solutions was subjected to a modified Bratton-Marshall reaction and the absorbances of the resulting solutions were measured spectrophotometrically at 536 nm (Meakin, Tansey & Davies, 1971). Plots of percentage residual concentration of benzocaine against dose of radiation (M rad) for the water cosolvent mixtures are shown in Figs 1a and 1b, along with a control for $1{\cdot}25 \times 10^{-4}$M solution of benzocaine in water.

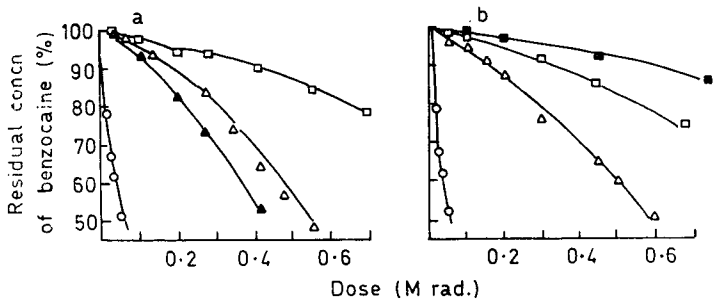

FIG. 1. Plots of % residual concentration of benzociane against dose of radiation for the water cosolvent mixtures. $1{\cdot}25 \times 10^{-4}$M, benzocaine in (a) ethanol (○—0% ▲—10% △—20% □—40% w/v) and in (b) PEG (○—0% △—5% □—10% ■—40 % v/v).

REFERENCE

MEAKIN, B. J., TANSEY, I. P. & DAVIES, D. J. G. (1971). *J. Pharm. Pharmac.*, **23**, 252–261.

Investigations of solid dispersions of primidone in citric acid

M. P. SUMMERS AND R. P. ENEVER

Department of Pharmaceutics, The School of Pharmacy, University of London, Brunswick Square, London WC1N 1AX, U.K.

Sekiguchi & Obi (1961) suggested that solid dispersion systems could be used to increase the rate of solution of sparingly soluble drugs, and subsequently, much work has been carried out on this concept (see Chiou & Riegelman, 1971).

The purpose of the present investigation was to produce solid dispersions of primidone (solubility in water 1 in 2000 at 20°) as part of a project concerned with the formulation, dissolution and absorption of such systems.

Organic glass-forming compounds have been proposed as suitable water-soluble carriers, and citric acid (solubility in water 1 in less than 1 at 20°) has been used by Chiou & Riegelman (1969) to form glass solutions with griseofulvin.