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Note

Thin-layer chromatographic studies of methadone salts

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Methadone is widely used for the treatment of narcotic addiction[1]. In order to reduce the rate of failure of the methadone maintenance programs, the development of sustained release preparations using methadone and its salts in the treatment of heroin addiction has been explored. In a number of studies conducted by Choulis and Papadopoulos[2–7] sustained release methadone tablets have been formulated and studied *in vitro* and *in vivo*. Also, more recently, Choulis and Sandhu[8] prepared two methadone salts, *viz.*, methadone-α-naphthalenesulfonate and methadone-*o*-benzoylbenzoate. Both salts are believed to have long-action properties. Nowhere in the literature the preparation and chromatographic study of these compounds is recorded.

In the present investigation, the thin-layer chromatographic separation of these salts in the presence of the pure compounds, using a number of solvent systems, is examined.

EXPERIMENTAL AND RESULTS

Thin-layer glass plates, 20 × 20 cm, pre-coated with silica gel (Analtech, Newark, Del. ,U.S.A.), 250 μm thick, were used.

From a number of solvent system employed, isoamyl alcohol–chloroform–acetone–water (3:5:1:1) gave the best separation. Other solvent systems used were ethanol–glacial acetic acid–water (3:3:4), (3:3:1) and (6:3:5), ethanol–chloroform–diethyl ether (2:3:5) and (4:3:3), and chloroform-dioxane-ethyl acetate-ammonia (5:12:2:1) and (2:10:4:1), but none of these gave significant spot separation.

Solutions of the salts were prepared by dissolving 10-mg quantities into 5 ml ethanol. Samples of the solutions were applied with a micropipet 1.5 cm from the bottom edges of silica gel plates, and the ascending chromatograms were allowed to travel 10 cm using the above mentioned solvent system (at room temperature). All experiments were carried out in duplicate and the developed spots were detected using iodine fumes.

The results are depicted in Fig. 1 where a distinct separation between the two salts and methadone, α-naphthalenesulfonic acid and *o*-benzoylbenzoic acid is observed. The R_F values obtained were 0.40, 0.30 and 0.90 for methadone, α-naphthalenesulfonic acid and *o*-benzoylbenzoic acid and 0.25 and 0.20 for the salts methadone-α-naphthalenesulfonate and methadone-*o*-benzoylbenzoate, respectively.

The technique is simple and accurate with reproducible results.

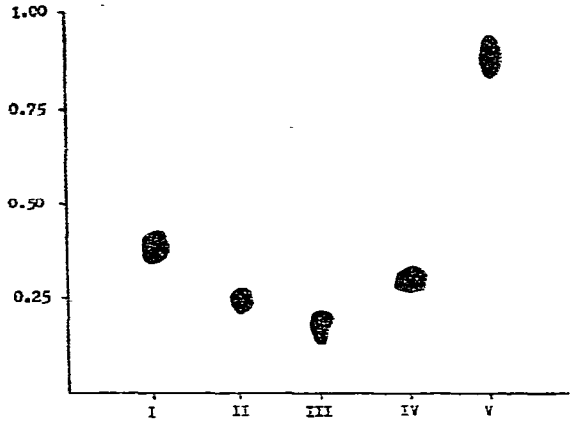

Fig. 1. Thin-layer chromatogram of (I) methadone, (II) methadone-α-naphthalenesulfonate, (III) methadone-*o*-benzoylbenzoate, (IV) α-naphthalenesulfonic acid, and (V) *o*-benzoylbenzoic acid.

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