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Note

Simplified o-phtalaldehyde urea spray for the detection of taurine on thin-layer chromatographic plates

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Taurine (2-aminoethanesulfonic acid) is a compound whose physiological significance has not been completely elucidated. Several important roles have been proposed for this compound including neurotransmitter function, anti-epileptic, regulation of absorption and digestion of lipids, effects on eating and drinking behavior, and a role in depressive illness[1].

Recently we have studied taurine in mixtures of amino acids and in plasma using thin-layer chromatography (TLC). We adapted the *o*-phthalaldehyde (OPT)–urea reaction originally described by Curzon and Giltrow[2] and subsequently modified by Gaitonde and Short[3] to the detection of taurine on TLC plates.

Curzon and Giltrow[2] used OPT to detect taurine and other amino acids on paper chromatograms. Subsequently Gaitonde and Short[3] developed a quantitative spectrophotometric assay for taurine involving the reaction of taurine with OPT in the presence of urea. We have modified the reagents employed by Gaitonde and Short so that the reaction can be conveniently run on TLC plates by employing a single reagent incorporating the OPT and urea.

The reagent was modified as follows. An amount of 30 g of urea was dissolved in 90 ml of 0.01 *M* sodium phosphate buffer pH 6.8 to which was added 10 ml of a 4% (w/v) OPT solution in methanol. The chromatograms were sprayed with this reagent. The plate was stored at 4° for 5 min. It was then sprayed with glacial acetic acid. Taurine under these conditions produces a brown spot which changes to purple over a period of 10 min. The only other amino acid producing a purple reaction is glycine. Glycine, however, can be readily separated from taurine.

Chromatography was carried out on Quantum LQD silica gel plates using 95% ethanol–water (63:37, v/v) as the solvent system. Volumes of 5 μl of amino acid solutions (5 μmoles/ml) were spotted. Under these conditions, glycine moves with an R_F value of 0.55 while taurine has an R_F value of 0.71.

The limit of detection for taurine using the modified spray is $6.25 \cdot 10^{-7}$ g (5 nmoles).

We believe the modified OPT–urea spray adapted to silica gel plate may be of value in studies of taurine metabolism.

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