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Note

Direct resolution of enantiomers via thin-layer chromatography using a chiral adsorbent

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In the past few years a number of advances have been made in the area of direct resolution of enantiomers, using chiral stationary phases (CSPs) in gas-liquid and high-performance liquid chromatography (HPLC). Pirkle *et al.*¹ have recently reported the development of a CSP, (*R*)-*N*-(3,5-dinitrobenzoyl)phenylglycine, which is ionically bonded to γ -aminopropyl silanized silica gel. The resulting support has broad applicability toward HPLC resolution of enantiomers^{1,2}. We now report the application of this CSP to the separation of enantiomers via thin-layer chromatography (TLC).

Microscope slides were coated with γ -aminopropyl silanized silica gel (Zorbax BP-NH₂; DuPont, Wilmington, DE, U.S.A.). The CSP (Regis, Morton Grove, IL, U.S.A.) was then bound to the resulting plates by continuous development of a tetrahydrofuran solution containing the CSP (1 g/20 ml). The coating of the plate was readily monitored visually since the bonded CSP is pale yellow. After the plates were coated they were air-dried and spotted with 5 μ l of a 1 mg/ml solution of racemic 2,2,2-trifluoro-1-(9-anthryl)ethanol (Aldrich, Milwaukee, WI, U.S.A.) and then developed with a solution of hexane-isopropanol (9.5:1). The resulting plate exhibited two fluorescent spots with R_F values of 0.59 and 0.49. The separation factor (α) of 1.50, calculated by using the approach described by Perry³, agrees favorably with the α of 1.33 reported for the same enantiomers when resolved by HPLC with this CSP⁴. The spots were identified as the (–)-isomer (R_F 0.59) and the (+)-isomer (R_F 0.49) of the alcohol by chromatographing the enantiomers separately on the TLC CSP.

The initial work described here demonstrates the applicability of this CSP to the direct separation of enantiomers via TLC. Further investigations into the scope and the qualitative and quantitative utility of this method are currently under way in our laboratory.

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