

Application of Phase-Trafficking Methods to Natural Products Research

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Abstract

A novel simultaneous phase-trafficking approach using spatially separated solid-supported reagents for rapid separation of neutral, basic, and acidic compounds from organic plant extracts with minimum labor is reported. Acidic and basic ion-exchange resins were physically separated into individual sacks ("tea bags") for trapping basic and acidic compounds, respectively, leaving behind in solution neutral components of the natural mixtures. Trapped compounds were then recovered from solid phase by appropriate suspension in acidic or basic solutions. The feasibility of the proposed separation protocol was demonstrated and optimized with an "artificial mixture" of model compounds. In addition, the utility of this methodology was illustrated with the successful separation of the alkaloid skytanthine from *Skytanthus acutus* Meyen and the main catechins and caffeine from *Camellia sinensis* L. (Kuntze). This novel approach offers multiple advantages over traditional extraction methods, as it is not labor intensive, makes use of only small quantities of solvents, produces fractions in adequate quantities for biological assays, and can be easily adapted to field conditions for bioprospecting activities.

Keywords

High-performance liquid chromatography, Organic polymers, Mixtures, Organic compounds, Pharmaceuticals.