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(NSC-88-2113-M-002-028)

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Migration Behavior and Separation of s-Triazine Herbicides in Micellar Electrokinetic Capillary Chromatography

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Journal of Chromatography A, 835 (1999)349-357

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ABSTRACT

The migration behavior and separation of various s-triazine herbicides, including five chloro-, three methoxy- and five thioalkyl-s-triazines, were systematically investigated in micellar electrokinetic capillary chromatography with phosphate buffer containing tetradecyltrimethyl ammonium bromide (TTAB) as a cationic surfactant. Buffer pH and micelle concentration affect significantly the selectivity and migration order of these s-triazines. With TTAB as a cationic surfactant, the electrophoretic mobility of triazines decreased with increasing the pH of the buffer in the range 4.7-6.0; the electrophoretic mobility increases with increasing the concentration of TTAB. The results indicate that the migration of s-triazines follows the order methoxytriazine ß ē chlorotriazine ß tē ioalkyltriazine and the migration order in each class is determined by the magnitudes of hydrophobicity. Thirteen s-triazines are completely separated within 6 min on adding TTAB (15 mM) to a phosphate buffer (70 mM) at pH about 3.8 or 4.75 with an applied voltage of -20 kV using a fused-silica capillary (43 ß 50 á ¥m I. D.).

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Migration Behavior and Selectivity of á z Blockers in Micellar Electrokineti Chromatography: Influence of Micelle Concentration of Cationic Surfactants

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ABSTRACT

The influence of micelle concentration of cationic surfactants on the migration behavior and selectivity of ten á z adrenergic blocking agents in micellar electrokinetic chromatography (MEKC) were systematically investigated at pH 6.5 and 7.0. Tetradecyl- and hexadecyltrimethylammonium bromides (TTAB and CTAB) were selected as cationic surfactants. The results indicate that, in addition to buffer pH, micelle concentration is an important separation parameter that influences the migration and selectivity of á z blockers in MEKC. The migration behavior and selectivity of labetalol and propranolol are most markedly affected. The resolution of peaks between atenolol, metoprolol and levobunolol enhances greatly on increasing the micelle concentration. In contrast, the peaks between acebutolol and nadolol and those between timolol and atenolol become unresolvable at concentrations near 30 mM at pH 7.0. Complete separation of these á z blockers was achieved either with CTAB and TTAB at a concentration in the range 15-20 mM and 12-15 mM, respectively, at pH 7.0 or with CTAB at a concentration in the range 27-30 mM at pH 6.5. Moreover, partition coefficients of á z blockers between the

aqueous and micellar phases at pH 7.0 were evaluated. The plot of the logarithm of migration factor (log k') versus the logarithm of octanol-water partition coefficient (log P_{ow}) reveals that , the migration of á-blockers possessing small hydrogen bond strength depends on the extent of micellar solubilization based on hydrophobic interactions, whereas the migration and selectivity of á-blockers with hydrogen bond donor characteristic are influenced considerably by hydrogen bonding interaction, in addition to hydrophobic interaction, in MEKC.