Retention mechanism in micellar liquid chromatography by use of linear solvation energy relationships

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In this study, 8 solutes (aniline, caffeine, p-cresol, ethyl benzene, methylparaben, phenol, pyridine, and toluene) have been tested in terms of linear solvation energy relationships (LSER). Several micellar liquid chromatography (MLC) systems using cationic surfactant cetyltrimethylammonium bromide (CTAB) and a mixture of water with (methanol, n-propanol, and n-butanol) modifiers were characterized using the LSER solvation parameter model. The effect of the surfactant and modifier concentration on the retention in MLC is discussed. Obtained LSER models demonstrate high potential to predict retention factors with high squared correlation coefficients ($r2 > 0.99$). This model is a helpful tool to understand the fundamental nature of solute-surfactant interactions and to characterize surfactant systems.