Chromatographic Behavior of Some Organic Compounds via Reverse Microemulsion Liquid Chromatography

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Water-in-Oil Microemulsion Liquid Chromatography represents an interesting mode of liquid chromatography. Microemulsions reveal high solubilisation ability for hydrophilic and hydrophobic compounds, hence their separation may be reached easier due to unique two-phase composition of microemulsions.

Reverse micelles are isolated, surfactant-coated water droplets, which have emerged as a tenable model for confined water in biological systems. Reverse micelles represent one of the normal membranous structures in cells. The biological processes occurring in a reverse micellar system mimic the membranous environment. There are only scanty literary data about application of reverse microemulsions as mobile phases in liquid chromatography [1].

The goal of the proposed work was study of influence of different factors e.g. concentration of anionic AOT and nonionic surfactant Brij-30, content of water, introducing of chaotropic and kosmotropic ions in the water pockets on the chromatographic behavior of some organic compounds, viz. drugs, vitamins etc. Butanol was selected as co-surfactant. The chromatographic measurements were carried out with a micro-column liquid chromatograph, “Milichrom-4”. The chromatographic column was a Silasorb C2 stainless steel column. Detection wavelength was 250 and 280 nm.

Investigations show that reverse microemulsions on the basis of AOT is preferable for cationic compounds. Separation of anionic samples is performed by mobile phase hexane-water-Brij-30 mixture. Retention of solutes is changed by introducing of some salts in the water pockets of water-in-oil microemulsion. Improving of separation of theophilline and caffeine is observed at the presence of chaotropic ions in water core in comparison of pure water (Fig.). The presence of micelles in the mobile phase influences the absorbance spectra of model compounds in ultraviolet region.
