ABSTRACT

Charles University in Prague
Faculty of Pharmacy in Hradec Králové
Department of Analytical chemistry

Candidate: Iva Jelínková
Supervisor: PharmDr. Petr Chocholouš, Ph.D.
Title of diploma thesis: Solid-phase extraction and its miniaturization by method Lab-On-Valve for determination of pharmaceutical substances

This thesis deals with the development of the solid-phase extraction (SPE) method with the use of microextraction by packed sorbent (MEPS) for the determination of vitamins A, D, E and the possibility to automate this method. The determination was based on absorption of vitamins on microcolumn MEPS, interfering components were removed by washing solution (dilute acetic acid of pH 3) and extraction was performed by eluent solution (100% ACN). Detection was made by UV spectrophotometer at wave lengths of absorbing maximum for vitamin A – 325 nm, for vitamin D – 265 nm, for vitamin E – 295 nm.

The method was optimized. There was developed a program, where concentrations of individual vitamins, dosing volumes, flow speed and composition solvents were tested.

After the optimization method there was performed the extraction and the subsequent determination of blood plasma fortified with vitamins A, D, E by the sequential injection chromatography method. Recovery of the method for vitamin A was 156,83 %, for vitamin D 28,38 %, for vitamin E 15,79 %. Repeatability was evaluated, for which there were used three sprays of vitamins A, D, E. Results were obtained by the use of low concentrations of vitamins. The disadvantage of the method was low repeatability and poor reproducibility. For improving reproducibility and efficiency further development is needed.