

Abstract

This thesis is focused on the analysis of pharmaceutically active ingredients with use of mixed-mode liquid chromatography on columns Acclaim mixed-mode WAX-1, Acclaim mixed-mode WCX-1 and Acclaim mixed-mode HILIC-1. For the purpose 16 analytes were chosen with acidic, basic or neutral properties. All the analytes are of great use in pharmaceutical industry thus their efficient separation plays a very important role. Mixed-mode chromatography is becoming an increasingly popular method for the analysis of diverse compounds thanks to its mechanism based on the combination of two and more interaction modes (hydrophilic interaction, ion-exchange and reversed-phase mechanism). This HPLC technique can be useful for the analysis of the compounds which are poorly soluble in mobile phase while using reversed-phase techniques for charged and polar compounds. Considering the above mentioned facts the application of mixed-mode stationary phase can be especially beneficial for the development of new drugs which may have various physical and chemical properties. In this work 16 analytes were analysed under different conditions. The data obtained from the measurements was used to construct the plots depicting relationship between the retention factors of analytes and organic compound content, buffer concentration and pH. On the grounds of these plots as well as known chemical structures of the analysed molecules and publications which have dealt with the same problem, the possible interaction mechanisms in various chromatographic systems were proposed. Based on these explanations some important considerations on the optimization of the chromatographic conditions as well as selection of the stationary phase for different types of analytes were made.