

Study the effect of eluent composition on benzimidazole and its derivatives retention on hypercrosslinked polystyrene

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Abstract

The effect of water-acetonitrile and water-methanol eluents composition on newly synthesized benzimidazole derivatives sorption by supercrosslinked polystyrene (SCP) using high performance liquid chromatography was studied. It is shown that the nature of the organic modifier affects on the considered biologically active compounds sorption. The angular coefficients of the Snyder-Sochevinsky equation, characterizing the number of organic modifier molecules, displaced by one molecule of sorbate, for benzimidazole derivatives, are calculated. The angular coefficients was calculated from the dependence, characterized by a high coefficient of determination. The article demonstrated that the Snyder-Sochevinsky model could be used for describing of all studied compounds sorption in the system “SCP – water-methanol eluent” and for describing of volume sorbates with hydrophobic substituting groups sorption in the system “SCP – water-acetonitrile solution”. The value of the slope of the Snyder-Sochevinsky equation of benzimidazoles sorption from water-methanol solutions is higher than that from water-acetonitrile solution; this fact indicates a lower elution power of the water-methanol eluent in compare to water-acetonitrile eluent. The Snyder-Sochevinsky model is not fulfilled in the concentration range from 75% to 85% of acetonitrile for small volume benzimidazole molecules containing hydrophilic amino and hydroxymethylene groups in the «SCP – water-acetonitrile eluent» system.

The composition of the mobile phase influence of benzimidazoles sorption was studied. It is demonstrated the relationships between volume fraction of the organic modifier increase and decreases of benzimidazoles sorption.

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