ABSTRACT

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Title of Diploma Thesis: **Separation of selected inorganic ions using the sequential injection chromatography**

The ability of the guard column Dionex Ionpac® CG5A (2 x 50 mm, P/N 046104) to separate some transition metal cations from water samples, using Sequential injection chromatography (SIC) system was demonstrated. The type of separation was based on ion exchange interaction and the column was filled with particles functionalized by a bilayer of anion-exchange and cation-exchange latex. The chelating agent used in eluent was pyridine-2,6-dicarboxylic acid (PDCA). A post-column reagent with 4-(2-pyridylazo) resorcinol (PAR) was used for spectrophotometric detection.

For optimization, two methods were used: Simplex and univariant studies. Ideal conditions of the separation were found. The mobile phase consisted of PDCA, formic acid, sodium sulphate, and sodium hydroxide in the concentrations 4 mmol/l, 40 mmol/l, 4 mmol/l and 2 mmol/l, respectively. The concentrations of the post-column reagent components were 0.3 mmol/l of PAR, 150 mmol/l of the ammonium hydroxide, 60 mmol/l of the sodium hydrogencarbonate and 45 mmol/l of the sodium hydroxide.

The volume of the sample was 90 µl and it was placed between two zones of water to get better peak symmetry. An eluent flow rate of 8 µl/s was used. Determination of three cations - Cu (II), Zn (II) and Fe (II) – in water samples was performed. The separation time was shorter than 4 minutes.