Analysis of Some Nitrophenols in Water Samples By Reversed-Phase High Performance Liquid Chromatography (RPHPLC)

M. Chalányová and M. Hutta

Department of Analytical Chemistry, Faculty of Natural Sciences, Comenius University , Mlynská dolina CH-2 , 842 15 Bratislava , Slovak Republic

Nitrophenols as a group of compounds covering wide range of polarities are present in environmental matrices at very low (ppb, ppt) levels. Some of them are listed in EPA priority polutants list (e.g. 2,4- dinitrophenol etc.). Several routes exist by which they enter soil , surface , underground and drinking water as well as food chain. Problem of their analysis is still attractive and open to the solutions.

Our work is intended to investigation of problems associated with their RPHPLC analysis involving large volume sample injection and/or introduction , column-switching techniques and gradient elution. Chromatographic behaviour with respect to sorption capacity of 8 nitrophenols: picric acid , 2,4-dinitrophenol , 2,5-dinitrophenol , 2,6-dinitrophenol , 2-nitrophenol, 3-nitrophenol, 4-nitrophenol and 4-nitro-3-cresol was evaluated by breakthrough curve measurements at different conditions on short precolumns filled with Silasorb C8, Separon SGX C18 , Separon RPS and Silasorb Phenyl sorbents.Additional data on their retention behaviour were obtained under isocratic and gradient elution conditions. These data enabled us to find conditions for satisfactory separation of all nitrophenols mentioned above in isocratic run.

Volumes as high as 25 ml of drinking water spiked with these nitrophenols were injected into the precolumn , what resulted in their convenient quantitation at the ppb levels. With respect to trace analysis the influence of potential inorganic macroconstituents (sulphates , chlorides , nitrates) in water samples was studied. The results show that salting-out and salting-in effects could influence detection limits and selectivity of HPLC system .