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Comparison of the performance of different reversed-phase columns for liquid chromatography separation of 11 pollutant phenols

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Abstract-

A systematic optimization of the HPLC separation of a mixture containing 11 pollu- tant phenols (PPs) using a Hypersil ODS (250mm64.6 mm, 5 lm) column and UV- DAD detection has been carried out. The binary mobile phases used were obtained by mixing 50mM phosphate (pH = 3.0) and methanol, ACN, or THF as organic modi- fiers. After selecting ACN as an organic modifier, the effects of pH and temperature on PPs separation were studied. A mobile phase of 50mM acetate (pH = 5.0)-ACN (60:40 v/v) at 508C allowed the separation of 11 phenols but not to baseline in 17 min. To improve the performance of this separation, the following RP columns were tested: Luna C18 (2), Purospher C18, Synergi C12, Synergi Fusion C18, Gemini C18, Luna Cyano, Lichrospher C8, and Envirosep-PP (polymeric). In all the cases, the performance (analysis time, retention, selectivity, resolution, asymmetry factors, and efficiency) was evaluated. A further reoptimization of the mobile phase was car- ried out for all the columns by studying the ACN content and pH, with the aim of improving the above-mentioned separations and selecting the most suitable one for PPs analysis.

Index Terms- Pollutant phenols / Reversed-phase columns

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