Title: **Characterization of HILIC systems: underivatized silica as stationary phase.**

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Hydrophilic interaction liquid chromatography (HILIC) is a type of chromatography especially used for the analysis of polar substances, using mobile phases with a high content of organic solvent and polar stationary phases. Nowadays, its retention mechanism still under study due to its complexity.

In this work, the Abraham's model based on linear free energy relationships (LFER) has been used in order to characterize the study column (Kinetex® with silica support), obtaining information about the mobile phase volume inside the column and the retention mode under certain working conditions. As a way of characterizing this column, the behavior of different homologous series (n-alkyl benzenes, n-alkyl phenones and n-alkyl ketones) has been analyzed with different proportions of mobile phase (acetonitrile and water mixture). According to the mobile phase composition, significative variations on the retention mode and on the mobile phase volume inside the column can be observed.

In fact, this study could be useful for the determination of possible hold-up volume markers, depending on the prevailing retention mode.

Keywords: Chromatography, HILIC, RPLC, Abraham's model, homologous series, mobile phase, stationary phase.