Title: **Study on association phenomena in mobile phases used in hydrophilic liquid interaction chromatography.**

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Date: January 2019

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Hydrophilic Interaction Liquid Chromatography (HILIC) is a useful separation technique of polar compounds that use a polar stationary phase and a hydro-organic mixture as mobile phase. The hydro-organic mixture usually contains between 80-90 % of organic solvent, such as the commonly used solvent acetonitrile. The high acetonitrile proportion can cause changes in the behavior of the solutes content, giving rise to the appearance of association phenomena such as ion pair formation, homoassociation and heteroassociation.

The association phenomena formation is also promoted according to the buffer solution employed. Triethylamine and pyrrolidine will cause the retention time decrease in HILIC, may be due to the formation of associates.

The reproduction of HILIC conditions in the conductometric titrations of different compounds allows the qualitative study of potential association interactions. To explain qualitative results a mathematic model was applied, assuming quantitative acid-base reactions in titrations, the homoassociation formation, the complex equilibrium existence and the limitation Debye-Hückel law, that justify that in only very diluted solutions the agreement between calculated and experimental results is possible.

In the absence of homoassociation conditions, the qualitative results indicate the possible presence of ion pairs, which were tried to analyze by capillary electrophoresis, but due to incorrect results obtained, it was necessary use again conductometric titrations.

Keywords: HILIC, acetonitrile, ion pair, homoassociation, conductometric titrations, capillary electrophoresis.