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Exploring the effect of buffer strength on the retention time of weak acids, neutral and weak bases in hydrophilic interaction liquid chromatography (HILIC) Mode

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Hydrophilic interaction liquid chromatography (HILIC) is orthogonal to conventional reversed phase high-performance liquid chromatography (HPLC) mode allowing separation of polar compounds, yet the separation mechanisms reported in HILIC are much more complicated. Therefore, this study was designed to investigate the effect of water layer thickness on silica gel and the amount of ammonium ions present within the buffer on HILIC retention mechanism. Thus, a test system was designed which used weak acids, neutrals and weak bases as probes with three different strengths (5, 10 and 20 mM) of ammonium acetate, formate and propionate as the counter-ions to compete with the test probes with ionised silanol groups and water present in the stationary phase. A Kromasil 60-

SSIL column (150 mm×4.6 mm×4 μm, pore size 60Å) was used as stationary phase. As a result, retention times were examined for the test probes at 90% acetonitrile (ACN) with 10% of 5, 10 and 20 mM of ammonium acetate, formate and propionate. As the buffer strength increases, the thickness of the water layer on the surface of the silica gel increases and also the repulsion between ionized silanol groups and acidic test probes will decrease. On the other hand, such increase in buffer strength will increase the competition between the ammonium ions and basic test probes. In conclusion, At 20 mM buffer strength acidic probes with low log P values retain more due to reduced repulsion by silanol groups. However, in 5 mM buffer strength basic probes with low logP value will be retained longer.

Biography

Naser Al-Tannak has completed his PhD at the age of 31 years from Strathclyde University and Postdoctoral Studies from Strathclyde Institute of Pharmacy & Biomedical Sciences, Strathclyde University, United Kingdom. He is an Assistant Professor in Faculty of Pharmacy- Department of pharmaceutical Chemistry-Kuwait University. He has published more than 12 papers in reputed journals.

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