

**Investigation on liquid chromatographic separation of  
basic compounds using silica column with  
aqueous/organic mobile phase containing  
triethylamine and acetic acid**

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**Abstract**

A high-performance liquid chromatography (HPLC) method using silica column eluted with aqueous solvent mobile phase containing triethylamine (TEA) and acetic acid (ACH) at trace percentages was characterized for the analysis of basic compounds. The key mechanism of this system is ion-exchange accompanying interaction of silanol groups. The increase in the ACH concentration in the mobile phase minimizes the ionization of the silanol group, leading to reduced retention time. However, the greater extent of ionization of silanol caused by the increase of TEA concentration helps to retain basic compounds in the column. Further, the protonated TEA that is positively charged also competes for the ionized silanol group with basic compounds, resulting in the modification of retention time. On the other hand, the retention becomes longer with increasing proportion of either organic or aqueous solvent in mobile phase, and partial replacement of methanol with acetonitrile.