Langmuir Adsorption Isotherm of Benzene and Some Nitrogen-Containing Heterocycles

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The adsorption isotherms of benzene and some nitrogen containing heterocycles with aqueous/organic eluent solution were investigated in this experiment. And Langmuir isotherm was applied to describe the chromatographic retention mechanisms of substances on the surface of the adsorbent. The values of the adsorption isotherm were compared with different mobile phase compositions such as water and water/acetonitrile (80/20 vol%). According to the experimental results, parameters a and b of Langmuir isotherm were decreased when acetonitrile was added into the mobile phase, but except one component 1,2,4-triazole. The chromatographic retention of the investigated substances with the aqueous/organic eluent solutions can be determined by the interactions of sorbates and eluent, and also the polar, nonpolar properties of their chemical structures. Experimental results showed that adsorption isotherm curves of benzene, imidazole, indole, and indoline were logarithmically increased in aqueous solution, expect one substance, 1,2,4-triazole, was linearly increased.