

Abstract

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This thesis deals with measuring dissociation constants (the pK_a value) and the lipophilicity of nitrogenous heterocycle derivatives produced at the Faculty of Pharmacy in Hradec Králové.

Two methods were used to determine the pK value: potentiometric titration and spectrophotometry. Potentiometric titration almost invariably produced relatively exact results, however the results of pK value obtained by spectrophotometry were sometimes difficult to replicate. Dissociation constants were compared on the basis of the method applied, and also with the theoretically determined dissociation constant calculated by means of the ChemDraw Ultra 12.0 software. The results obtained by the two experimental methods turned out to be very similar, corresponding to the theoretical pK value.

Lipophilicity is another essential property of drugs tested in the preclinical stage. It specifies the aqueous or lipophilic phase affinity of a drug, substantially affecting the drug's ADMET in organism. Lipophilicity was determined on the basis of capacity factor value identified by RP-HPLC measurement using the ZorbaxEclipse XDB C18 RRHT column 4,6 x 50,0 mm; 1,8 μ m. The capacity factors identified were subsequently compared to the $ClogP$ value generated by ChemDraw Ultra 12.0. The correspondence between the experimentally identified capacity factors and the $ClogP$ values proved very satisfactory.