

ABSTRACT

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Analytical Chemistry

Candidate: Bc. Klára Žižková

Supervisor: Doc. PharmDr. Hana Sklenářová, Ph.D.

Title of Diploma Thesis: Automation of toxicology tests

The aim of this diploma thesis was to find suitable method for determination of luciferase of the Ist and IInd types using the sequential injection method and optimize the assay conditions. The main aim was to automate analysis in a series of samples prepared for the testing of various substances, which, in particular, may affect the level of secreted luciferase (type II) upon the interaction of cells with tested substances in toxicological studies. The theoretical part describes luminescence, its types and applications. In addition, the types of luciferases and reagents with which a chemical reaction takes place are mentioned and principles of flow techniques are described. The review of luciferase determinations was carried out.

Measurements were performed using the sequential injection method. Three instruments were used for the measurement. One flow injector analyser and one sequential injection analyser with two detection methods - batch-flow spiral detection cells were used. Measurement optimization was performed based on concentration and volume of samples and reagents, their aspiration order and also flow rate of measurement together with suitable working voltage. But due to the low repeatability and higher signal noise of the older device type, optimization will continue within the framework of the following diploma thesis with the new detector.