ABSTRACT

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Title of dissertation thesis:
Sequential injection analysis capability in automation of analytical processes

This dissertation, composed as a commented collection of four scientific articles and one undergoing project, introduces four novel applications in the field of automated flow methods and one application in the field of chromatographic methods used in analytical part of a complex pharmacological study.

It the field of pharmaceutical analysis, three works were successfully optimized, validated, and published in scientific journals. Those works include:

a) Automation of permeation studies within a sequential injection analysis system connected to a liberation unit and carrying out experiments with living cells.
b) Pharmacological study of an antiretroviral drug efavirenz including its determination by fast chromatographic method in three types of sample matrices – in a medium from permeation studies with cellular models, in a Krebs solution from rat placenta perfusions, and in placenta tissue lysates.
c) Determination of lovastatin, a blood cholesterol decreasing drug, in dietary supplements using an automated solid phase extraction with a selective molecularly imprinted polymer sorbent in a sequential injection chromatography system.

In the field of environmental analysis, one work was published in a scientific journal and one work is still the undergoing project. Those works include:

d) Determination of herbicides metsulfuron methyl and chlorsulfuron in a flow-batch system using automated extraction on a carbon nanotubes sorbent followed by fluorometric detection after UV irradiation of herbicides.
e) Automated determination of herbicide 2,4-dichlorophenoxyacetic acid using a sequential injection system with an extraction cell and a home-made polymer inclusion membrane.