

ANALYTICAL CHEMISTRY

Analytical applications of optical probe and other modern devices in UV-Vis spectrometric and luminescence methods.

supervisor: prof. Dr. Yaroslav Bazel, DrSc. (yaroslav.bazel@upjs.sk)

consultant: prof. Mgr. Vasil' Andruch, DrSc.

study form: full time

Annotation: The development in the field of analytical applications of optical probe as well as other innovative devices and technical solutions suitable for automation and miniaturization of analytical measurements. The development of new luminescence and UV-Vis spectrometric methods for the determination of selected analytes in environmental samples, biological fluids, pharmaceuticals, new materials, etc. The validation and verification of the reliability of the developed methods, comparison with classical procedures.

Development of novel miniaturized and automated analytical methods.

supervisor: prof. Mgr. Vasil' Andruch, DrSc. (vasil.andruch@upjs.sk)

consultant: RNDr. Jana Šandrejová, PhD.

study form: full time

Annotation: Analytical chemists draw their attention to miniaturization and automation of analytical procedures, as evidenced by continually increasing number of articles in this issue. The theme is focused on the design of new schemes, technical and technological solutions for miniaturization and automation of analytical procedures; design of new solutions to overcome disadvantages and limitations microextraction techniques; development of microextraction procedures using ultrasound and vortex, and the development of new optical / visual sensors.

Alternative green organic solvents compatible with spectroanalytical detection techniques.

supervisor: prof. Dr. Yaroslav Bazel, DrSc. (yaroslav.bazel@upjs.sk)

consultant: prof. Mgr. Vasil' Andruch, DrSc.

study form: full time

Annotation: The development of environmentally friendly solvents compatible with various detection techniques such as atomic absorption, fluorescence, UV-Vis spectrometry. The investigation of analytical properties and perspectives of analytical systems based on switchable solvents as a suitable alternative to classical extraction techniques for the determination of selected analytes in model and real samples.

The use of micro-extraction techniques and high performance liquid chromatography (HPLC) in the analysis of bioactive substances at a low concentration level.

supervisor: doc. RNDr. Katarína Reiffová, PhD. (katarina.reiffova@upjs.sk)

study form: full time

Annotation: The present trend in analytical chemistry in the field of pre-treatment of complex samples is focused on the development of new micro-extraction methods using analytical systems with a small volume of analytical reagents. The main goal of the proposed topic will be the development of a new two-step analytical method suitable for effective preconcentration and subsequent determination of a selected group of bioactive substances at a low concentration level.