

**Report on the defense of the doctoral thesis of MSc. Volodymyr Pauk, a Ph.D. student of analytical chemistry, held on December 16, 2015 at 11:00 hour**

**Department of Analytical Chemistry, Faculty of Science, Palacký University,**

**17. listopadu 12, Olomouc**

Prof. Juraj Ševčík, a chairman of an examination board for a defense of a doctoral thesis, welcomed referees, members of the examination board and introduced MSc. Volodymyr Pauk, a Ph.D. student of analytical chemistry. Supervisor Prof. Karel Lemr read his evaluation of the student and recommended approaching the defense. As a head of the department, he also presented a positive attitude of the department to complete MSc. V. Pauk's study by the defense.

The chairman asked MSc. V. Pauk to present important results of his doctoral thesis entitled "Forensic applications of mass spectrometry". The student provided an overview of analytical tasks important in forensic sciences and aims of his thesis. Further, he discussed in details a new method for identification of Prussian blue and indigo. Limits of detection in tens of picograms were achieved. It is worth noting that the method was applied to analyze a microsample from the painting 'Crucifixion' from the St. Šebestián Church on Saint Hill in Mikulov. Prussian blue was identified which dated the sampled blue layer to 18<sup>th</sup> century or a newer era. Supercritical fluid chromatography/mass spectrometry (SFC/MS) was used to solve another two tasks. Plant gums were differentiated identifying and determining monosaccharides. Study of chromatographic behavior of selected cathinones and phenylethylamines in SFC provided new knowledge to develop a fast analytical method applicable in screening of new designer drugs. The studied new designer drugs in their mixture were successfully distinguished in less than 1.7 min. In the end, MSc. V. Pauk concluded his research results.

Subsequently, the referees, Assoc. Prof. Lucie Nováková, Assoc. Prof. Michal Roth and Assoc. Prof. Petr Bednář, read their expert opinions. The student responded the comments and questions. All referees were satisfied with the student's answers and his explanation. All three expert opinions were positive and recommended the defense of the thesis. The supervisor had no additional comments.

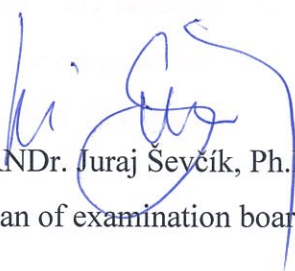
In a public scientific debate, Assoc. Prof. J. Petr was interested in urine analysis of new designer drugs. MSc. V. Pauk explained that sample preparation would be necessary. The developed method was prepared for screening of substances. Prof. J. Ševčík asked for chiral analysis of new designer drugs, the student mentioned that substance identification is relevant for illegal market control. In this context chirality is unimportant.

MSc. Volodymyr Pauk answered questions and responded comments demonstrating his deep knowledge of studied topics, his experience with applied analytical methods and ability to formulate correct conclusions.

In a closed part of the defense, the members of the examination board summarized and discussed the achieved results, the opinions of the referees and MSc. V. Pauk's presentation, after discussion they balloted. All members decided to choose evaluation „passed“ (see ballot's protocol). Chairman Prof. J. Ševčík disclosed the decision of the board.

It can be concluded that MSc. V. Pauk fulfilled his study duties, successfully passed the defense of his doctoral thesis. It can be recommended a degree „doctor“ (abbreviated Ph.D.) to be conferred on MSc. Volodymyr Pauk by Palacký University.

Olomouc, December 16, 2015



Prof. RNDr. Juraj Ševčík, Ph.D.  
chairman of examination board