

## **Supervisor's report**

**Academic year 2019/2020**

**Student: Milena Šetka, MSc.**

**Topic: Nanoscaled polypyrrole for sensing gaseous analytes and volatile organic compounds**

Milena Šetka was a very enthusiastic and talented student showing high interest in the chosen topic of the thesis. During the whole period of her doctoral studies, she proved that she was able to self-educate herself in this interdisciplinary area covering chemistry, physics, material science and usage of many characterization techniques, for example XPS or Raman spectroscopy. Not only was she skilful in the chemical and electrochemical synthesis and analysis of her sensing nanomaterials, but she also worked hard on the challenging interpretation of her results and careful study of particular sensing mechanisms with the selected analytes, which are of high importance in medicine (especially early diagnosis of diseases from the breath of patients), monitoring of quality and safety of food and air.

As the results in the beginning of her thesis, especially in electrochemical preparation and testing of sensing material, were not highly promising due to difficult material incorporation into a sensing layer, she shifted her focus towards a different synthesis method and succeeded in preparing an efficient and highly sensitive material for detection of various VOCs and gaseous molecules.

Milena also kept in active contact and regular consultation with her co-supervisor, Dr. Stella Vallejos Vargas, during the whole of her studies. She was also very proactive in gaining the relevant research knowledge in well recognized scientific laboratories abroad, namely in Spain (Tarragona and Barcelona) as well as in Mexico. Thanks to these new experiences, she was able to manifest the performance of her sensing layers using Love wave acoustic mode, which belongs rather to untutored and less common transducing approach. Therefore, it is worth noting that her thesis significantly contributed to the knowledge in this area. The main outcomes of her scientific visits were published with international co-authorships in several papers in relevant journals in the field of sensors, which are indexed in the database Web of Science.

In general, Milena showed outstanding publication activity as the results of her work are summarized in 6 scientific articles in category Q1, 1 article in Q2 rank and 3 conference proceedings. From 10 presented publications, Milena is the first author of 8 contributions and the second author in 2 of them.

Together with her co-supervisor, Dr. Vallejos, I give an overall positive evaluation to her thesis and recommend it to oral defence for obtaining a PhD degree in front of the respective committee.

In Vítkov, 29.6. 2020

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doc. Ing. Jana Drbohlavová, Ph.D.