Report on habilitation thesis of Dr. Mateusz Zawadzki

Processes associated with collisions of low energy electrons and polyatomic molecules in gas phase

Scientific and Academic Profile of the Candidate

2010 Dr Zawadzki obtained PhD in Physics at the University Strathclyde in Glasgow, United Kingdom, with the thesis *Bose-Einstein condensate manipulation and interferometry.*

2011-2016 His scientific career continued as adjuct at Department of Atomic, Molecular and Optical Physics, at Faculty of Applied Physics and Mathematics, Gdansk University of Technology.

2018-2017 acted as visiting researched at Heyrovsky Institute of Physicsl Chemistry at Czech Academy of Sciences in Prague.

2017-2019 he was Fulbright senior postdoctoral researcher and Fellow researcher at Department of Physics, at California state University Fullerton.

Since 2019 he is Adjunct at Department of Electron Physics, at Institute of Physics and Computer Sciences, Gdansk University of Technology.

General Assessment of the Habilitation Thesis abd research activities

Dr. Zawadski present his research achievements in the field ***Processes associated with collisions of low energy electrons and polyatomic molecules in gas phase*** in a form of 7 thematically related scientific articles published in scientific journals between 2018-2020. Each paper is introduced by a short description of the research details, and possible applications of the obtained results:

1) M. Zawadzki, T.F.M. Luxford, J. Kocisek Carbozylation enhances fragmentation of furan upon resonant electron attachment Journal of Physical Chemistry A 124 (2020) 9427
2) M. Zawadzki, P. Wierzbicka, J. Kopyra Dissociative electron attachment to benzoic acid (C7HgOQ2) Journal of Chemical Physics 152 (2020) 174304
3) M. Zawadzki, M. Rankovi¢, J. Kocisek, J. Fedor Dissociative electron attachment and anion-induced dimerization in pyruvic acid Physical Chemistry Chemical Physics 20(10) (2018) 6838
4) M. Zawadzki, M. Cizek, K. Houfek, R. Curfk, M. Ferus, S. Civi8, J. Kočíšek, J. Fedor Resonances and dissociative electron attachment in HNCO Physical Review Letters 121 (2018) 143402
5) M. Zawadzki, A. Chachereau, J. Kocisek, C. Franck, J. Fedor Electron attachment to hexafluoropropylene oxide (HF PO) Journal of Chemical Physics 149 (2018) 204305
6) M. Zawadzki Electron-impact ionization cross section of formic acid European Physical Journal D 72(12) (2018) 1

7) M. Zawadzki, M. Khakoo Low energy differential elastic electron scattering from acetonitrile (CH3CN) Journal of Chemical Physics 149 (2018) 124304

Besides this selection of selected papers, Dr. Zawadski presented additional sets of research papers for different research fields and time periods.
In the period 2011-2017 present a set of 8 research articles *focused on the studies of isomeric effects and functional group substitutions for the total cross sections*. This set of studies was carried out in the group of Prof. Czeslaw Szmytkowski.

During his visit at Heyrovsky Institute of physical Chemistry 2017-2020 Dr. Zawadski carried out set of studies focused on *dissociative electron attachment and electron ionization studies*, resulting in 7 topical papers.

During the Fulbright fellow period, 6 papers focused *on elastic electron scattering processes – differential cross sections*.

Dr. Zawadski also present set of studies of *angular-differential cross sections for elastic and inelastic ratio Time of Flight measurements*, which were obtained during his collaboration in USA, India, UK.

Teaching, organisational and popularizing activities of Dr. Zawadski

Dr. Zawadski teaching cover full spectrum of teaching activities: Lectures, tutorials, seminars, projects and laboratories . The teaching activities were mainly carried out at Gdansk University of Technology. In addition he was active as teacher also at California state university.
He supervised large number of engineering theses at Gdansk University of Technology, and also 9 students at California state university.
Dr. Zawaski organised several student trips and popular science presentation.

Final Evaluation

Dr. Zawadski presented scientific achievements constitute a significant contribution to the development of a particular discipline, including a series of thematically related scientific articles published in scientific journals, showed significant scientific or artistic activity and shall be awarded by the "post-doctoral degree doctor habilitated" in the field of natural sciences discipline: physical sciences.

Prof. Dr. Štefan Matejčík, DrSc

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