

Singapore, 19th of April 2022

To Division of Student Affairs; Faculty of Science
Department of Doctoral Studies
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Review of the PhD thesis entitled “Nanostructured conducting polymer composites” that was submitted by Islam Mohamed Mohamed MINISY to the Department of Physical and Macromolecular Chemistry, Faculty of Natural Sciences, Charles University in Prague, Czech Republic.

I hereby declare that I do not have any conflict of interest with the PhD candidate and my assessment of the thesis is unbiased.

The thesis is based on eight published manuscripts, all manuscripts were published in reputable scientific peer-review journals. The amount of work conducted by the candidate stands out in relation to international standards. The candidate was able in relatively short period of time to secure a great number of scientific publications and maintain their high quality.

The subject of the thesis is timely. The nanostructured conducting polymer composites are one of the advance materials that may revolutionize the technology in broad spectrum of applications. For that reason, it was worth to conduct this study and evaluate (i) synthesis of such composites and (ii) their performance in number of possible applications.

The thesis is well organized, containing typical chapters. The introduction is well-written containing basic information about the conducting polymers and their composites, synthesis, chemical and physical properties, and finally their applications. The introduction provides necessary knowledge for anyone who wish to obtain a basic understanding in the area of interest but also the introduction provides a good summary for researchers in the field looking for comprehensive update on what is the current state of the art.

The aims are clearly stated, it is evident what is the main objective of the work. Increasing conductivity of conducting polymer is well studied research area, which is constantly evolving. The secondary aim of the work is to apply the developed advance materials in number of applications. That approach is typical in any research work where application of developed material is required for assessing the new material properties and functionality.

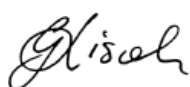
The experimental section contains typical description of the instrumentation, working principles and methodologies applied in this work. It is clear the work was conducted up to the international standards, using specialize and commonly recognizable research tools and equipment and maintaining high quality measurements protocols.

The results and discussion section are presented to showcase the innovativeness of the research work. The results are detailed and sufficiently clear to understand the research works in question. The candidate focuses on the most crucial aspects of the work, merging the data

in one uniform thesis. The data presented, in most instances, carry sufficient evaluation of measurement uncertainties, providing confidence in the obtained data. There is sufficient use of references throughout the study, it is well noted that results and discussion section is supported also by references. From scientific point of view, the results carry high novelty. The candidate provided new look in obtaining the nanostructured conducting polymer composites that go beyond typical synthesis routes. The candidate also was able to link the composites to specific applications. It is appreciated how candidate describes in details the nature of the nanostructured conducting polymer composites, providing new insights into controlling the chemical and physical properties of such composites. The candidate provided evidence of broad knowledge and experience in the areas of synthesis of nanostructured conducting polymer composites, catalytic processes based on oxygen reduction reaction, removal of organic pollutants and heavy metals.

The conclusion section is comprehensive summary of the obtained results and additional reinforcement of the objectives and novelty of the obtained data. It would be beneficial to exclusively include future directions in the area.

To summarize, the thesis is of high quality. It contains broad spectrum of useful results, suitable for PhD thesis. The candidate provided sufficient novel data to be granted PhD degree.



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