

OPINION

by Prof. Konstantin Ivanov Hadjiivanov

Institute of General and Inorganic Chemistry - Bulgarian Academy of Sciences

for Ph. D. Thesis

for awarding the educational and scientific degree "doctor"

in professional direction - 4.6 "Informatics and computer sciences",

doctoral program: 01.01.12. "Informatics"

Author: M.Sc. Borislav Enchev Georgiev.

Title: Investigation of Oil Refining Processes using Intercriteria Analysis.

Scientific supervisors: Prof. Krasimir Atanasov and Prof. Dicho Stratiev.

Institution: Institute of Biophysics and Biomedical Engineering - Bulgarian Academy of Sciences.

1. General presentation of the procedure and the Ph.D. student

Borislav Georgiev was born in 1975 in St. Zagora. He received his master's degree in 2000 from the University "Prof. Dr. Asen Zlatarov" - Burgas, speciality industrial ecology. After that, the Ph.D. student upgraded his education through a number of qualification courses in the country and abroad.

M.Sc. Georgiev is a Ph.D. student at the Institute of Biophysics and Biomedical Engineering - Bulgarian Academy of Sciences, and his main job is at Lukoil - Burgas. He is an established specialist in the field of oil refining. According to the Scopus database, Georgiev's scientific publications are related to his Ph.D. thesis. For thesis defence for awarding the educational and scientific degree Doctor, M.Sc. Georgiev presented a set of documents, including the required by law, namely: (i) application for admission to defence, (i) Ph.D. thesis, (ii) abstract (iii) diploma for completed higher education - master's degree, (iv) scientific CV, (vi) copies of his scientific works, included in the dissertation (vii) a list of noticed citations w/o self-citations, as well as other appropriate appendices.

The presented materials comply with the requirements of the Law on the development of the academic staff in the Republic of Bulgaria and the Regulation for its application, as well as with the specific requirements of the Bulgarian Academy of Sciences and the Institute of Biophysics and Biomedical Engineering. For the indicators from group A, the Ph.D. student collects 50 points out of 50 required, and for the group D - 102 points out of 30 required.

2. Relevance of the topic and knowledge of the problem

In general, the dissertation is related to the processing of high-molecular and low-value petroleum raw materials into more valuable products. The topic of the dissertation is advanced and is related to specific problems of the industry, in particular LUKOIL – Burgas.

M.Sc. Georgiev demonstrates a good knowledge of the scientific literature in the areas related to his thesis. The main key scientific articles on the topics are reflected in the references.

3. Characterization and evaluation of the thesis and personal contributions

The dissertation work of Engineer Georgiev covers 215 non-standard pages. Research has been conducted at a high scientific level. The fact that its scientific supervisors are among the leading Bulgarian scientists undoubtedly contributes to this.

In essence, the dissertation is multidisciplinary, mainly corresponding to the scientific fields of informatics and chemistry. Since I am not an IT specialist, I will focus on the chemical aspects.

The main practical difficulties in the processing of high molecular oil raw materials are related to the various parameters of the oil processed in the LUKOIL Neftohim Burgas refinery. With the help of intercriteria analysis, results have been achieved that have not only scientific, but also high practical value. Thus, for example, a classification of the types of oil whose tar fractions are most suitable for processing, as well as the conditions for processing less suitable types of oil, has been carried out. It has been shown that the profitability of catalytic cracking is controlled by the sludge yield and parallel feeding of the fresh catalyst has been found to improve the economic performance of the hydrocracking process.

4. Extended abstract

The extended abstract of the thesis is presented in Bulgarian (45 pages) and English (42 pages). It adequately reflects the results of the Ph.D. thesis.

5. Scientific indicators

The scientific publications included in the dissertation are a total of 7 in number, 5 of which are in journals included in the world databases WoS and/or SCOPUS. Two of these articles were published in the renowned journal ACS Omega, which, according to the "best quartile" rule, is in the highest - Q1 category. Its impact factor for the years of publication is 3.512 (2020) and 4.132 (2021), respectively. Two other articles are in Q2 journals with impact factors of 2.700 (Appl. Sci.) and 2.215 (Chem. Eng. Technol.), respectively. Another article was published in Oxidation Commun. – category Q4. In addition, the PhD student has two full-text articles published in journals without impact factor/rank. The PhD student declared lower

scientific indicators because he only used the WoS database and not always the IF for the year of publication.

The average number of co-authors in the papers presented is 9.0, which is normal for high-quality interdisciplinary research. In one of the key publications, Georgiev is the first author, which emphasizes his essential role in the research.

The Ph.D. student has not presented a list of participation in scientific meetings, although it is clear from the list of publications that he has participated in such. On the five scientific works in journals with an impact factor/rank, Georgiev presented a list of 31 independent citations, 28 of which can be found in the Scopus database. I randomly reviewed 5 citations and found them to be positive and two of them substantial.

6. Notes and recommendations


I have no significant remarks about the dissertation.

CONCLUSION

The scientific results summarized in the dissertation represent a significant and original contribution to science and have been positively evaluated by the international scientific community. Based on the above, I confidently give my positive assessment of the dissertation work and propose to the honourable scientific jury to award the educational and scientific degree of Doctor of Eng. M.Sc. Borislav Enchev Georgiev in Professional direction 4.6 "Informatics and Computer Sciences", Doctoral program 01.01.12 "Informatics".

March 07, 2024

Author of the opinion:



Prof. K. Hadjiivanov