

OPINION

of

dissertation for the acquisition of educational and scientific degree "DOCTOR"

Scientific field: 4. Natural sciences, mathematics and informatics

Professional field: 4.2 Chemical sciences

Scientific specialty: "Ecology and environmental protection"

Author of the dissertation: mag. eng. Dimitrinka Slavova Ivanova

Topic of the dissertation:

"Investigation of road sediment pollution along main and secondary transport arteries in the city of Burgas"

Member of the scientific jury: assoc. prof. PhD eng. Blagovesta Nikolaeva Midyurova

1. Actuality of the dissertation topic

Road transport is a continuous, year-round source of dust particles, which are the main atmospheric air pollutant. They result from the direct emission from motor vehicles and the suspension of particulate matter on the roadway. When determining the emissions of suspended dust particles from motor vehicles, the European approach of the European Environmental Protection Agency and the American approach of the American Environmental Protection Agency are applied.

The dissertation examines a very important aspect of air pollution and the protection of its purity, namely the role of motor vehicles, as the most dynamically developing source of emissions. Important results have been achieved related to the application of the American Environmental Protection Agency's methodology for sampling and analysis of road sediment on asphalt road surfaces, which was used to survey the transport arteries in the city of Burgas. I believe that the discussed topic is extremely relevant, and the set goals and tasks have been fulfilled to the required extent.

2. Overview of the cited literature

The dissertation contains a total of 2 chapters, developed on 127 pages and includes 32 figures, 17 tables and a total of 121 cited literary sources, of which 26 are in Cyrillic and 95 in Latin. Over thirty of the cited literary sources were published after 2012. The references are directly related to the topic of the study and show that mag. eng. Dimitrinka Ivanova knows perfectly the nature of the problem, both theoretically and practically. On the basis of the literature review, the unsolved problems were clearly identified, the research approach was defined, and the purpose and tasks of the dissertation work were clearly formulated.

3. Research methodology

The experimental studies carried out by the author were carried out using different methods. The method of continuous monitoring was applied, with the number of samples selected depending on the type, concentration or emission of a given pollutant in the air and its norms. Mathematical modeling was used with subsequent analysis of the data from the permanently operating monitoring stations. The emissions of individual categories of vehicles were evaluated based on emission factors that reflect the correlation of the amount of emissions of the relevant pollutant. Laser diffraction analysis, laboratory analysis with ISP-MS and sieve analysis of the road sediment samples were carried out. The above is evidence of the author's good theoretical training and his good research skills for choosing research methods and tools.

4. Dissertation Contributions

I evaluate the contributions in the dissertation work as scientific and applied. The author formulated them as follows:

1. A methodology for calculating the absolute value of traffic for any time of the year has been developed and implemented. Hourly, daily and seasonal load factors are determined.
2. A correlation has been proven between the relative average monthly concentration of nitrogen oxides and the change in the intensity of motor vehicle traffic.

3. The experimental results for road sediment and heavy metals have an applied nature in the methods for assessing atmospheric air pollution.
4. The obtained data can be applied to the calculation of emission factors and modeling of transport pollution in cities, as well as environmental impact assessment.

5. Publications and citations for the dissertation work

For the dissertation, the author presents a total of four scientific publications referenced in WoS and Scopus. The results of the scientific research work have been reported and discussed at various international and national forums and meetings in the country and abroad.

3 citations were noted on two of the publications.

6. Authorship of the obtained results

The applied results in the dissertation work, both in theoretical and applied terms, give me reason to consider that they are the personal work of the doctoral student.

I declare that I have no joint articles with mag. eng Dimitrinka Slavova Ivanova.

7. Abstract and author reference

After reading the abstract, I believe that the most essential part of the thesis is sufficiently presented in its limited volume, which allows assessing the problems, and also the proposed methods for the study of transport pollution of the city of Burgas.

8. Dissertation notes

I have essentially no comments on the dissertation work. Of course, I noticed a few grammatical and technical errors.

I would recommend the author to continue his work in the field of methods for the assessment of atmospheric air pollution, where she shows in-depth knowledge and genuine scientific interest.

9. Conclusion

My assessment of the presented dissertation work is categorically **positive**. I believe that the dissertation meets the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its Implementation, as well as the Regulations for the Terms and Conditions for Acquiring Scientific Degrees and Holding Academic Positions at the University "Prof. Dr. Asen Zlatarov " – Burgas.

The achieved results give me reason to propose that the educational and scientific degree be acquired "**Doctor**" from the **mag. eng. Dimitrinka Slavova Ivanova** in the scientific field - 4. Natural sciences, mathematics and informatics, Professional field - 4.2 Chemical sciences, specialty - "Ecology and environmental protection".

Burgas
06.10.2022

Signature:

Подпис заличен

Чл.2 от ЗЗЛД

/ assoc. prof. PhD eng. B. Midyurova /