

OPINION

by

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Last appointment: Department of Chemistry, Faculty of Natural Sciences, Konstantin Preslavsky University of Shumen

Regarding

the defense of dissertation for academic and scientific PhD degree, Area of Higher Education 4. Natural Sciences, Mathematics and Informatics, Professional Field 4.2 Chemical Sciences, Doctoral Program: Ecology and Environmental Protection, for the needs of the Faculty of Natural Sciences, "Asen Zlatarov" University of Burgas.

By order № УД-484/28.11.2024 signed by the Rector of Asen Zlatarov University of Burgas I'm appointed as a member of the scientific jury. At its first meeting I was chosen to write an opinion, which is in accordance with The Regulation on the Terms and Procedure for Acquisition of Academic Degrees and the Occupation of Academic Jobs at University of Burgas.

Eng. Stela Ivanova Naydenova is the sole applicant for the PhD degree at Department of Ecology and Environmental Protection, Faculty of Natural Sciences, "Asen Zlatarov" University of Burgas. I have received electronically all materials for the competition.

Brief Biographical Data

In 1997 Eng. Stela Naydenova was awarded a Master Degree in Industrial Ecology at Asen Zlatarov University of Burgas. Since 1998 Eng. Stela Naydenova is an assistant at Prof. Assen Zlatarov University of Burgas.

SCIENTIFIC AND APPLIED CONTRIBUTIONS

The title of presented dissertation is: Investigation of the content of polycyclic aromatic hydrocarbons in atmospheric aerosol.

The aim of the dissertation work is to study the concentrations and time variations of fine dust particles (FDP) 2.5 and associated with them biologically and ecologically significant pollutants, incl. polycyclic aromatic hydrocarbons (PAHs) for Burgas region.

The main tasks of the dissertation work are:

- 1) Preparation, organization and conducting of atmospheric aerosol sampling (FDP2.5) for different seasons and weather conditions in the city Burgas, in the period 2020 – 2023, and determining the mass concentration of FDP2.5 in the collected samples;
- 2) Gas chromatographic analysis with mass spectral detection for qualitative and quantitative analysis of PAHs and determination of their concentrations in the collected FDP2.5 samples;
- 3) Evaluation of the obtained results in relation to FDP2.5 and the associated PAVs. Research and establishment of the PAH distribution model in the studied FDP 2.5 samples;
- 4) Investigating the statistical relationships and dependencies of the levels of FDP2.5 and the concentration of PAHs in FDP2.5 with meteorological elements and other pollutants, and
- 5) Evaluation of the health risk for humans by calculating the carcinogenic equivalent concentration of all analyzed PAVs compared to that of PAV and the cancer risk in case of exposure to fine dust particles (FDP)-associated PAHs (Excess Cancer Risk).

SCIENTIFIC AND APPLIED CONTRIBUTIONS

- 1) The first detailed study of PAH concentrations in different fractions of dust particles for the Municipality of Burgas has been presented. The study provides a unique analysis of the concentrations and distribution of 17 PAH compounds in atmospheric aerosols, including both FDP2,5 and the coarser FDP10 fractions. This is the first study of its kind that covers different neighborhoods of Burgas and provides important data on the spatial and seasonal distribution of PAVs, which has not been studied so far in the region.
- 2) Revealing the relationship between PAHs, meteorological factors and other atmospheric pollutants. The study investigates and analyzes the correlation between the concentrations of the studied PPH-associated PAHs, key meteorological parameters and other atmospheric pollutants, and provides new data on the complex interactions in the atmosphere.
- 3) The study investigates and analyzes the correlation between the concentrations of the studied PAH-associated, key meteorological parameters and other atmospheric pollutants, and provides new data on the complex interactions in the atmosphere.

Meeting the Minimum National Requirement

The set of materials submitted by Eng. Stela Naydenova is in compliance with The Regulation on the Terms and Procedure for Acquisition of Academic Degrees at "Asen Zlatarov" University of Burgas and includes all administrative and scientific documents required.

Eng. Stela Naydenova submits for the completion a total list of 3 publications (Web of Science and Scopus, SJR). It should be noted that in all 3 publications the applicant is a first author.

1. Naydenova, S., Veli, A., Mustafa, Z., Hristova, E., Gonsalvesh-Musakova, L. (2020). PM-Associated PAHs during winter in Burgas, Bulgaria, 20th International Multidisciplinary Scientific GeoConference SGEM 2020, Vol. 20, p. 457-464. SJR 10 p.
2. St. Naydenova, A. Veli, Z. Mustafa, S. Hudai, E. Hristova & L. Gonsalvesh-Musakova (2022). Atmospheric levels, distribution, sources, correlation with meteorological parameters and other pollutants and health risk of PAHs bound in PM2.5 and PM10 in Burgas, Bulgaria – a case study, Journal of Environmental Science and Health, Part A, 57:4, 306-317, DOI: 10.1080/10934529.2022.2060669 Q3 15 p.
3. Naydenova, S., Veli, A., Mustafa, Z., Dimitrov, A., Gonsalvesh., Seasonal variations in PAHs (BaPeq) content in particulate matter under urban conditions, Journal of Environmental Protection and Ecology 25, No 6, 1775-1784 (2024), ISSN 1311-5065 Q3 15 p.

According to the regulations procedures in professional field 4.2 Chemical sciences involve quartiles Q1, Q2, Q3 and Q4 according to the metrics SJR. In this regard Eng. Naydenova submitted 2 publications Q3 (30 points); and 1 publication GeoConference SJR (10 points) – (total 40 p.).

According to the analysis of the results the minimum number of points (30 points) required for the PhD degree in the professional field 4.2 Chemical Sciences, according to the Minimal National Requirements, and Regulations for the development of the academic staff of "Asen Zlatarov" University of Burgas are met.

CONSLUSION

Once I have read the materials and scientific publications submitted and have made an analysis of their significance and the scientific contributions contained in them, I think that the candidate: Eng. Stela Naydenova has accomplished the minimal national requirements set in the Republic of Bulgaria t, The Regulation on the Terms and Procedure for Acquisition of Academic Degrees and the Occupation of Academic Jobs at "Asen Zlatarov" University of Burgas, and all other relative normative documents. I find it worthwhile to **give my positive assessment** and to recommend to the Scientific Jury to make a report to the Faculty Council of the Faculty of Natural Sciences to ask them to grant the PhD degree to Eng. Stela Naydenova at "Asen Zlatarov" University of Burgas in the Area of Higher Education 4.

Natural Sciences, Mathematics and Informatics, Professional Field 4.2 Chemical Sciences,
Doctoral Program: Ecology and Environmental Protection.

25.01.2025

Scientific Jury Member:

Подписан заличен
Чл.2 от ЗЗД

(Prof. Christomir/Christov, DSci)