R E P O R T
by

Prof. DSc Anton Atanasov Apostolov, Laboratory on Structure and Properties of Polymers,
Faculty of Chemistry and Pharmacy, Sofia University "St. Kl. Ohridski", retiree
Member of the Academic Jury set to render a decision
on a procedure for the acquisition of Academic Degree
("Doctor of Philosophy" (PhD)
in the Professional Field 4.2. Chemical Sciences according to the Classifier of the Areas of Higher Education and the Professional Fields (Scientific Specialty "Polymers and Polymer Materials")
Author of the dissertation: Eng. Selin Erdinch Kyuchyuk-Hyusein.
Topic: Electrospun fibers with core-sheath architecture based on poly(ethylene oxide), a biodegradable aliphatic polyester and beeswax,
Scientific supervisors:
Assoc. Prof. Dilyana Paneva, DSc, Prof. Iliya Rashkov, DSc, Corresponding. Member of BAS
This Report is prepared in response to Order № RD-09-125/01.10.2025 issued by the Director of the Institute of Polymers, Bulgarian Academy of Sciences, following the decision made by the Academic Jury that was held on 01.10.2025.

The Report is in compliance with *Development of Academic Staff in the Republic of Bulgaria Act (DASRB)*, *the Rules for the Application of the Development of Academic Staff in the Republic of Bulgaria Act,* the *Rules of BAS* and with the *Rules set at the Institute of Polymers, Bulgarian Academy of Sciences, for applying the Act aforementioned*.

1. Assessment of the scientific and research accomplishments of the candidate

The dissertation submitted to me for review is extremely well-formed, with a large number and clear explanatory text figures (80), a large number (110) of cited mainly contemporary literary sources and several tables. The participation of the doctoral student is impressive: 5 articles in journals with Q1 and Q2 quartiles, 2 posters, 2 oral communications, 2 awards, 21 (?!) citations of the literary sources included in the dissertation. Outside the topic of the dissertation: 2 patents, 3 posters and participation in 2 contracts. Most of the fibers, spinning solutions and nozzles discussed in the thesis are new. The previously used electrospinning equipment has been redesigned accordingly.

2. Opinions, notes and recommendations

I will present some of the most significant results in the dissertation, along with my notes and comments on them. The dissertation is written flawlessly, with almost no spelling or technical errors. The presentation is fluent, well explained with figures and appropriate sub-figured text. The conclusions correctly reflect the main results and contributions of the dissertation work. I have a few minor comments:

- It is not correct to write more digits after the decimal point of the absolute error of the quantity than of the quantity itself. For example, the contact angle is 123 ± 5^{o}, (p. 79), and not as written 123 ± 4.71^{o}, (p. 79), while for example the tensile strength is presented correctly (0.55 ± 0.06 MPa, p. 63)
- Several of the abbreviations are not explained
- It will be better if the X-ray patterns located on one page are on the same scale, which would facilitate their comparison (e. g. Fig. G1-3)

- Some of the texts on the axes of the figures should be written in a larger font, because they are illegible (e. g. Fig. G2-14)
- When recording the stress-strain curves of fibers with an outer shell of wax, is there no slipping of the thread (due to the good lubricating properties of the wax) in the dynamometer holder, leading to higher reported level of deformation?

In general, the set goals and objectives have been met and the conclusions drawn from them sound reasonable. The research was conducted using several modern methods. The results obtained with their help seem completely reliable. The publications cited in the dissertation have several co-authors and electrospinning has been worked on at the Institute of Polymers for nearly 15-20 years. However, based on the excellently written dissertation and the preliminary report, I was left with the impression that the doctoral student conducted some experiments herself and processed the data from others, i.e., I have no doubt about her significant contribution to the 5 publications (in all of them she is in first place!), as well as to her work on the dissertation. Unlike previous publications by authors from the Institute of Polymers, in this case the parameters that need to be changed in order to optimize the electrospinning process are 2-4 more, which makes this optimization even more difficult and places it between science and art.

The abstract complies with the requirements for its preparation and adequately reflects the main points and contributions of the dissertation work. Some inconvenience is caused by the citation/transfer in several places to figures in the dissertation.

I have no comments on the English version of the abstract.

The above recommendations and notes do not essentially harm the merits of the dissertation, but are expressed mainly for the purpose of the future work of the doctoral student. In fact, I have not read such a well-prepared and written doctoral dissertation for a long time, which would have such merits and far exceed the necessary requirements.

3. Conclusion

According on the grounds of the documentation presented by the candidate, on her publications reviewed and the above assessment, I strongly recommend on the Academic Jury to render a positive decision for the acquisition of the Academic Degree PhD on Selin Erdinch Kyuchyuk-Hyusein.

Date: 13.11.2025 Report prepared by……

(Prof. A. Apostolov), Member of the Academic Jury