

REPORT

to occupy the academic position:

| | |
|-----------------------|---|
| "Professor" | x |
| "Associate Professor" | |
| | one of the academic positions indicated shall be marked with the sign "X" |

Candidates to occupy the position:

| | | | | | | |
|---|-------------------|-------------------|-------|-------------|-----------|-----------|
| 1 | Assoc. prof. | PhD | Rayna | Georgieva | Bryaskova | UCTM |
| № | academic position | scientific degree | name | middle name | last name | workplace |

Scientific area:

| | |
|------|---|
| 4 | Natural sciences, mathematics and informatics |
| code | name |

Professional area:

| | |
|------|------------------|
| 4.2 | Chemical science |
| code | name |

Scientific specialty:

| |
|---------------------------------------|
| Chemistry of high molecular compounds |
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The competition has been announced:

| | | | |
|-------------|------------|---------------------------------|---------------------|
| 23 | 19.03.2024 | Polymer engineering | Chemical Technology |
| in SG issue | date | for the needs of the Department | Faculty |

The report was written by:

| | | | | | |
|-------------------|-------------------|-------|-------------|-----------|-----------|
| Assoc. prof. | Dr. | Petyr | Ninov | Velev | UCTM |
| academic position | scientific degree | name | middle name | last name | workplace |

1. Report for the candidate:

| | | | | |
|-------------------|-------------------|-------|-------------|-----------|
| Assoc. prof. | PhD | Rayna | Georgieva | Bryaskova |
| academic position | scientific degree | name | middle name | last name |

1.1. Meeting the minimum requirements under the Regulations:

| | | |
|--|-----------|-----------------------------|
| A) The candidate meets the minimum requirements | 20 points | x |
| B) The candidate doesn't meet the minimum requirements | 0 points | |
| | | one of the answers given is |

| | | |
|--|--|--------------------------|
| | | marked with the sign "X" |
|--|--|--------------------------|

It must be filled in if answer B is marked. The publication activity of the candidate is analyzed. The response of the results achieved (quoted) is analyzed.

1.2. Relevance of scientific and / or applied research:

| | | |
|---|----------|--|
| A) The research is relevant. Part of the research is pioneering (no results are known on the topic by other authors) | 8 points | x |
| B) Research is relevant. Results from other authors are known for each of the topics and / or applications studied. | 6 points | |
| C) Most of the research is relevant, but also some results are presented that have no scientific and / or applied value | 4 points | |
| D) The smaller part of the research is relevant | 2 points | |
| E) Research is not relevant | 0 points | |
| | | one of the answers given is marked with the sign "X" |

The evaluation of the relevance of the research must be substantiated.

The presented publications are topical and are in areas that are the subject of intensive research worldwide. Some of the research is pioneering, for example, the publications listed under numbers 9, 10, 14, and 16.

1.3. Objectives of the research:

| | | |
|---|----------|--|
| A) Realistic and of scientific and / or applied interest | 8 points | x |
| B) Realistic, but not of scientific and / or applied interest | 4 points | |
| C) Unattainable (unrealistic) | 0 points | |
| | | one of the answers given is marked with the sign "X" |

Objectives must be specified. The type of the set objectives must be justified

Objectives:

- Development of new nanopolymer systems with applications in medicine.

In this area, the following have been synthesized and characterized:

- Hybrid materials based on organosilanes and polyvinyl alcohol with incorporated silver nanoparticles;
- "Ghost vaccines" for veterinary use;
- pH-sensitive micelles based on polyethylene glycol and poly(4-vinylpyridine) with incorporated gold nanoparticles in the core of the micelles;
- pH-sensitive micelles based on polyacrylic acid and poly(n-butyl acrylate) with incorporated

fluorescent compounds in the core of the micelles.

- Preparation of polymer coatings with special properties:
 - Preparation of bio-inspired polymer coatings on a stainless steel (SS) substrate;
 - Preparation of photoactive antibacterial polymer coatings on stainless steel (SS) substrate, using various photosensitizers that possess good mechanical and antibacterial properties;
 - Synthesis of a complex of amino-modified protoporphyrin IX with incorporated silver nanoparticles (PPIX-ED/AgNPs), which is used as a final layer to obtain photoactive antibacterial coatings.

1.4. Candidate research contributions:

| | | |
|--|-----------|--|
| A) With lasting scientific and / or applied response, they form the basis for new research and applications | 20 points | x |
| B) They are of significant scientific and / or applied interest, complete and / or summarize previous research | 16 points | |
| C) They are of scientific and / or applied interest | 12 points | |
| D) Lack of significant contributions | 8 points | |
| E) Lack of contributions | 0 points | |
| | | one of the answers given is marked with the sign "X" |

Contributions must be specified. The type of results achieved must be justified.

1. Synthesis, characterization, and application of polymeric materials with pronounced antibacterial properties for medical applications.
2. Preparation of "ghost" vaccines for veterinary use based on silver nanoparticles stabilized with polyvinyl alcohol (publications 3 and 5).
3. Design, synthesis, and characterization of polymeric micelles with incorporated gold nanoparticles (publications 11, 12, 13).
4. Design, synthesis, and characterization of new fluorescent polymeric micelles for applications in biomedicine and medicine (publications 9, 10, 14, 16, 19).
5. Preparation of innovative antibacterial coatings based on new photoactive nanogels (publications 6, 8, 15, 17, 18).

1.5. Participation of the candidate in the achievement of the presented results:

| | | |
|--|----------|--|
| A) The candidate has at least an equal participation in the submitted papers | 8 points | |
| B) The candidate has at least an equal participation in most of the submitted papers | 7 points | x |
| C) The candidate has a secondary participation in most of the submitted papers | 4 points | |
| D) The candidate participation is unnoticeable | 0 points | |
| | | one of the answers given is marked with the sign "X" |

Critical notes must be provided if one of the items C or D is marked.

1.6 Pedagogical activity:

| | | |
|--|----------|--|
| A) The candidate has effective and sufficient pedagogical activity at the university. The textbooks issued are modern and useful (they meet the requirements of the Regulations). The work with undergraduate and doctoral students is at a high professional level. | 8 points | x |
| B) The candidate has sufficient pedagogical activity at the university. The textbooks issued satisfy the requirements of the Regulations. | 6 points | |
| C) The pedagogical activity and / or textbooks issued are insufficient (do not meet the requirements of the Regulations) | 0 points | |
| | | one of the answers given is marked with the sign "X" |

Critical notes must be provided if one of the items B or C is marked.

1.7. Critical notes:

| | | |
|---|----------|--|
| A) Lack of critical notes | 8 points | x |
| B) Critical notes of a technical nature | 7 points | |
| C) Critical notes that would partially improve the results achieved in a small part of the research | 5 points | |
| D) Critical notes that would partially improve the results achieved in most of the research | 3 points | |
| E) Significant critical notes | 0 points | |
| | | one of the answers given is marked with the sign "X" |

Critical notes must be provided if one of the answers C, D or E is marked.

1.8. Conclusion

| | | |
|--|---|--|
| A) The evaluation of the candidate's activity is POSITIVE | This evaluation is assigned to a total number of at least 50 points | X 79 |
| B) The evaluation of the candidate's activity is NEGATIVE | This evaluation is assigned to a total number below 50 points | |
| | | one of the answers given is marked with the sign "X" |

To be filled in if requested by the member of the scientific jury

For the needs of the Department of Polymer Engineering, I recommend that Associate Professor R.

Bryaskova be awarded the academic position of "Professor" in professional direction 4.2. Chemical sciences scientific specialty "Chemistry of high molecular compounds".

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|-------------------|--|-----------|
| 16.06.2024 | The report was written by: Assoc. prof Petar Velev | |
| date | | signature |