

Response to Editor and Reviewers

Dear Editor and reviewers:

We would like to express our sincere thanks to the editor and reviewers for the constructive and positive comments concerning our manuscript entitled “Surface functionalization of polyester textiles for antibacterial and antioxidant properties (polymers-2039091). Those comments were all valuable and very helpful for revising and improving our paper, as well as the important guiding significance to our research.

We have revised our paper in accordance to your comments. In what follows, we would like to response the comments of you and give a detailed account of the changes made to the original manuscript. The comments are reproduced, and our responses are given directly afterward in a different color. All page numbers refer to the revision manuscript file with tracked changes. Those changes are highlighted in yellow within the attached file “Revision Manuscript”.

Reviewer 1

Comments and Suggestions for Authors

Point 1: The paper must be cardinaly improved before will be accepted for publication.

Response 1: We would like to thank the Reviewer for carefully reviewing the manuscript and providing comments and suggestions to improve the quality of the manuscript.

Manuscript has been edited by MDPI for English editing.

Point 2: The authors recently published a similar paper where hydrazine was used as PET activator instead of ethylenediamine. It is unclear what the advantages and disadvantages of this replacement are.

Response 2: We gratefully appreciate your comment. The advantage of this work could be attributed to that the ethylene unit can support the crosslinking between the polymeric chain.

Point 3: The problem is not highlighted in the introduction, why the authors decided to functionalize the polyester textiles is hard to understand. To stimulate the interest of the readers it is important to add information on the virucidal potential obtained samples (<https://doi.org/10.1016/j.cej.2022.137048>).

Response 3: We appreciate it very much for those helpful publications, and I have read and cited this wonderful article and improved the Introduction. Again, I appreciate your advice earnestly.

Point 4: What type of polyester woven fabric was used exactly? If it is PET, why at PET hydrolysis was created two hydroxyl groups? Where on the scheme is dopamine or glucose? The depicted creation of the bonds between oxygen in the carboxylic group and amine in the ethylenediamine is principally impossible!!!! Please carefully check

the scheme based on cited references 16 and 17. In general, the scheme must be strongly corrected, all stages, intermediates, and chemical substances should be written.

Response 4: We gratefully appreciate your comment. The polyester used in this work is Polyester woven fabric (195 g/m²) that acquired through Misr El-Mahalla Co.; Egypt.

PET hydrolysis was created in two hydroxyl groups because it is polyethylene terephthalate.

Regarding the scheme, we are very sorry for your confusion, the scheme was revised and corrected.

Point 5: Polyester treatment in the methodology was written confusingly and should be rewritten, references to the relevant methodology should be done.

Response 5: We gratefully appreciate your comment. We are very sorry for your confusion; we have corrected it in the revised manuscript, and highlighted in pages 3,4

Point 6: Why does for comparison the fabrication of the silver nanoparticles not conducted for untreated PET?

Response 6: We gratefully appreciate your comment. principally, the modified polyester was ready to capture silver ion due to the presence of amino group, and then treated in the second step with dopamine to convert silver ion to silver nanoparticles and dopamine to polydopamine.

Point 7: Please add FTIR results in the form of the Table with signals and assigned groups and compare them to signals presented in references 16 and 17.

Response 7: We gratefully appreciate your comment. The FTIR data was summarized in table 1

Table 1. ATR-FTIR characteristic absorption peaks of PET before and after coating with AgNPs-PDA.

Wavenumber, cm ⁻¹		
Peak assignment	PET	PET-EDA-AgNPs-PDA
C–O stretching vibration	1709	1713
C–O ester vibration	1010-1240	1010-1240
C–H aliphatic asymmetric stretching vibration	2967	2973
C–H aromatic asymmetric stretching vibration	3073	3082
C–H out of plane vibration	717-820	717-820
C–N stretching vibration	-	3436, 3206
Carboxylate and amino group stretching vibration	-	955, 2145

Point 8: Please calculate how many moles and molecules of ethylenediamine were attached to the unit of the surface area and mass of the PET.

Response 8: We gratefully appreciate your comment. The amount of EDA attached in polyester was calculated as percentage (%), it was mentioned as below:

This polyester treatment was achieved via EDA, and the weight increased by 10.8%. After being immersed in silver nitrate and polymerized by polydopamine, the uptake of AgNPs was 34%.

Point 9: Please cite highly relevant papers where similar results were presented.

<https://doi.org/10.1016/j.cej.2022.137048>

<https://doi.org/10.3390/polym14061138>

Response 9: We appreciate it very much for those helpful publications, and I have read and cited those wonderful articles and improved the Introduction. Again, I appreciate your advice earnestly.

Point 10: English and typos should be carefully corrected.

Response 10: Manuscript has been edited by MDPI for English editing.

Reviewer2

Comments and Suggestions for Authors

Dear Author,

The manuscript prepared for review presents the functionalization of the surface of polyester textiles in terms of their antibacterial and antioxidant properties.

The use of silver compounds in the form of nanoparticles is a very well-known and widespread solution, mainly due to its well-known properties.

Point 1: In the literature you can find works on polyester composites with nanosilver [Pączkowski, P.; Puszka, A.; Miazga-Karska, M.; Ginalska, G.; Gawdzik, B. Synthesis, Characterization and Testing of Antimicrobial Activity of Composites of Unsaturated Polyester Resins with Wood Flour and Silver Nanoparticles. *Materials* **2021**, *14*, 1122. <https://doi.org/10.3390/ma14051122>] as well as information on regulations in application, e.g. European law. Silver can also be replaced with much more expensive gold and cheaper copper with equally well-known anti-microbial and less toxic properties.

Response 1: We appreciate it very much for those helpful publications, and I have read and cited those wonderful articles and improved the Introduction. Again, I appreciate your advice earnestly.

Point 2: Please expand the Introduction and Conclusions sections.

Response 2: We gratefully appreciate your comment. The introduction and conclusion sections were revised.

Point 3: Please expand discussion of results.

Response 3: Thank you for your nice suggestion. The manuscript was revised.

Point 4: Please provide information that distinguishes the presented research from the solutions known in science.

Response 4: Thank you for your nice suggestion. The manuscript was revised.

The work should be significantly improved so that it can be analyzed more thoroughly.

Thank you for your nice suggestion. The manuscript was revised.

Best regards,

Reviewer 3

Comments and Suggestions for Authors

Overall, this manuscript demonstrates the functionalization of PET using ethylenediamine, silver nanoparticles and dopamine, showing improved antibacterial and antioxidant performance. The fabrication is simple and practical, and the experimental data supports the design of the material. This work is worthy of publication in *Polymers*. However, the following concerns should be addressed before publication. In addition, the editing of the manuscript should be greatly improved.

Response: We would like to thank the Reviewer for carefully reviewing the manuscript and providing comments and suggestions to improve the quality of the manuscript.

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Major concerns:

Point 1: The description of y-axis in Figure 4 (thermograms) is wrong. For TGA, it should be “Weight %” or “Mass %”, not “Weight loss %”. They are the opposite results. In addition, the description on TGA results is too simple. Since there are three phases observed, what are those phases? Please clarify.

Response 1: Thank you for your nice suggestion. Fig. 4 was modified, and this section was modified.

Point 2: I understand that the second figure in Figure 2 is the zoom-in description, however, it is not appropriate to show the data like this (its repetitive data). If the authors want to show the details, please use inset figure and clarify in the figure legend.

Response 2: Thank you for your nice suggestion. Fig. 2 was modified as suggested by reviewer

Point 3: In Figure 8, the antibacterial effect on *Staph. aureus* was not much different between PET-EDA and AgNPs-loaded PET-EDA, while the effects were obvious in *E. coli* case. Is there any explanation? Is it because of that *Staph. aureus* is more resistant to AgNPs?

Response 2: It could be due to the amine groups breaking down the cell walls of *E. coli* by snatching away the metal ions that bacteria need to survive.

Minor concerns:

1. Please check all the abbreviations in the paper. Please add the full chemical name of PET when first introduce the concept in the paper; please also indicate the full name of EDA, FESEM and DPPH, etc.

Thank you for your nice suggestion. The abbreviations were defined in all the manuscript.

2. Please revise the figures (e.g., Figure3, there is part of the figure missing in Figure 3d; the figure legend is too simple, all the four panels should be described).
3. Thank you for your nice suggestion. Fig. 3 was modified as suggested by the reviewer.
4. Please carefully check the spelling and grammar, there are several errors. E.g., Page2, Line57, “This consisted of also of polyester...”. In addition, why are there some quotations in the experimental section (e.g., Page2, Line 61, 69, and 78)? If the authors are citing the previously reported methods, corresponding references should be added.

Thank you for your nice suggestion. This section was revised.

5. Please carefully check all the units used in the manuscript and keep the format identical.

Response: We would like to thank the Reviewer for carefully reviewing the manuscript and providing comments and suggestions to improve the quality of the manuscript.

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