

## Reactive silver inks for antiviral, repellent medical textiles with ultrasonic bleach washing durability compared to silver nanoparticles

This manuscript reports the development of an antiviral and repellent medical textile. The preparation method, characterization, and antiviral application have been described in this manuscript. The manuscript has a smooth flow of ideas and is written in good English. One of the strongest points of the work is that it potentially considered the effect of ultrasonic bleach washing on performance, which is very important for repeated applications of the medical textile. Another positive aspect of the work is that the experimental data has been statistically demonstrated. The graphical representations are clear, logical, and easy to read. Scientists all over the world are trying hard to formulate strategies to fight against emerging biothreats. Considering the COVID-19 pandemic, this research is very timely and valuable. However, the manuscript has several limitations and errors which must be addressed adequately before it could be recommended for publication in *ACS Appl. Bio Mater.* Journal.

1. Is silver inks being used for the first time in developing antiviral medical textile? If so, mention this point strongly in the introduction. If not, cite relevant literature and describe what are the promising features of silver inks. Especially, the advantages of silver inks over silver nanoparticles should be thoroughly described.
2. The authors should properly highlight the novel aspect of this work. In doing so, they should cite papers describing similar studies and distinguish how their study differ from the reported studies.
3. It is also important to discuss which antiviral materials have been developed by researchers against the selected viral strains used in this study and how the material developed in this study is better than other reported antiviral materials.
4. The chemical interactions of silver, silver ink, PDMS with the PET have not been described properly. What occurs exactly during the curing stage should be detailed.
5. The focus of the research was to develop antiviral textile; however, it is very surprising that the mechanism of antiviral action has not been considered. I strongly suggest demonstrating the mechanism with a proper scheme and adding a thorough discussion with citations. It will significantly improve the quality of the article. In describing the

mechanism, the biochemical features of the investigated viral strain could be incorporated.

6. Is it possible to image the surface after virus adhesion?

7. Did the authors run repeated antiviral experiments with the developed textile surface? It is necessary to understand how the dead virus cells affect the antiviral performance of the fabric in the subsequent cycles. What happens to the dead virus cells during the bleaching steps?

8. Is there any reason for not considering XPS/EDS to identify the presence of Ag. The authors used XRD in their experiments.

9. What motivated the authors to use Ag nanoparticles of a particular size i.e., 20 nm?

10. The reported material, if commercialized, would be used by healthcare providers. Therefore, it is necessary to understand whether the product would have any negative effect on the body. I suggest adding an animal skin irritation test.

11. The authors should add some limitations of the study in the conclusion so that potential readers could think more about the topic. It is also suggested to signal possible future research directions based on the knowledge developed in this study.

12. I suggest authors cite the following relevant recent articles to keep their work updated.

[ACS Appl. Bio Mater. **2021**, 4 (8), 6175-6185]  
<https://doi.org/10.1021/acsabm.1c00508>

[ACS Appl. Mater. Interfaces. **2020**, 12 (19), 22120-22128]  
<https://doi.org/10.1021/acsami.9b23058>

In addition to the major comments, please pay attention to the following minor comments to improve the scientific merit of the report.

Page	Line	Comment
1	51	Use the name of the polymer
1	49	What type of fabric was used?
1	53	Which exact virus stocks were used?
4	15	We show that.....It is better to avoid the first person in the scientific papers.
4	31	Avoid first-person.
4	33-40	The sentence is grammatically incorrect.
5	48	I suggest using either XRD patterns/diffractograms not spectra.
16	31	A space is needed between digit and unit. 0.2 mg
16		Maintain uniformity in writing. Line-35: 1 hour; Line-43: two hours.
16	54	A space is needed between digit and unit. 5 kV
17	7	Use cm <sup>-1</sup> correctly.
17	11	Degree Celsius should be separated from digit e.g., 22-25 °C
17	13	Space needed: 25 °C
17	38	Space needed: 54 °C
17-18		Use symbols uniformly. Either µL/ µl, not both.
18	22	Subscript problem. CO <sub>2</sub>
17-18		Use symbols uniformly. Either mL/ ml, not both.
18	42	Space needed. 37 °C. Subscript problem: CO <sub>2</sub>
6	15	Use proper citations.
8	29-33	The combination of ultrasonic agitation and bleach not only mechanically removes silver from the textile but chemically oxidizes the silver. Did the author confirm the oxidation?
10	15	XRD is a diffraction technique, not spectroscopy