

## Enhanced virus filtration in hybrid membranes with MWCNT nanocomposite

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### Review timeline

Original submission: 4 August 2018  
Revised submission: 3 November 2018  
Final acceptance: 13 November 2018

Note: Reports are unedited and appear as submitted by the referee. The review history appears in chronological order.

## Review History

### RSOS-181294.R0 (Original submission)

#### Review form: Reviewer 1

**Is the manuscript scientifically sound in its present form?**

Yes

**Are the interpretations and conclusions justified by the results?**

Yes

**Is the language acceptable?**

Yes

**Is it clear how to access all supporting data?**

Yes

**Do you have any ethical concerns with this paper?**

No

**Have you any concerns about statistical analyses in this paper?**

No

**Recommendation?**

Accept as is

**Comments to the Author(s)**

The comment is given in the report (see Appendix A).

## Review form: Reviewer 2

**Is the manuscript scientifically sound in its present form?**

Yes

**Are the interpretations and conclusions justified by the results?**

Yes

**Is the language acceptable?**

Yes

**Is it clear how to access all supporting data?**

No

**Do you have any ethical concerns with this paper?**

No

**Have you any concerns about statistical analyses in this paper?**

No

**Recommendation?**

Major revision is needed (please make suggestions in comments)

**Comments to the Author(s)**

The article presents an interesting methodology for the synthesis of membranes, but some changes must be made as indicated below:  
"Sigma-Aldrich" does not exist.

In the formula of Flux (F) superindices must be used.

Reference 2 is incorrect.

Reference 5 is incorrect.

Reference 7 is incorrect.

Reference 11 is incorrect.

Reference 16 is incorrect.

Reference 17 is incorrect.

Reference 18 is incorrect.

Reference 19 is incorrect.

Reference 25 is incomplete.

Reference 26 is incorrect.

Reference 33 is incorrect.  
Reference 34 is incorrect.  
Reference 35 is incorrect.  
Reference 36 is identical to the reference 1.  
Reference 40 is identical to the reference 7.  
Reference 42 is incorrect.  
Reference 43 is incomplete.  
Reference 44 is incorrect.  
Reference 53 is incorrect, use subindices.

## Decision letter (RSOS-181294.R0)

26-Oct-2018

Dear Professor Hernadi:

Title: Enhanced virus filtration in hybrid membranes with MWCNT nanocomposite  
Manuscript ID: RSOS-181294

Thank you for your submission to Royal Society Open Science. The chemistry content of Royal Society Open Science is published in collaboration with the Royal Society of Chemistry.

The editor assigned to your manuscript has now received comments from reviewers. We would like you to revise your paper in accordance with the referee and Subject Editor suggestions which can be found below (not including confidential reports to the Editor). Please note this decision does not guarantee eventual acceptance.

Please submit your revised paper before 18-Nov-2018. Please note that the revision deadline will expire at 00.00am on this date. If we do not hear from you within this time then it will be assumed that the paper has been withdrawn. In exceptional circumstances, extensions may be possible if agreed with the Editorial Office in advance. We do not allow multiple rounds of revision so we urge you to make every effort to fully address all of the comments at this stage. If deemed necessary by the Editors, your manuscript will be sent back to one or more of the original reviewers for assessment. If the original reviewers are not available we may invite new reviewers.

To revise your manuscript, log into <http://mc.manuscriptcentral.com/rsos> and enter your Author Centre, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision. Revise your manuscript and upload a new version through your Author Centre.

When submitting your revised manuscript, you must respond to the comments made by the referees and upload a file "Response to Referees" in "Section 6 - File Upload". Please use this to document how you have responded to the comments, and the adjustments you have made. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response.

Once again, thank you for submitting your manuscript to Royal Society Open Science and I look forward to receiving your revision. If you have any questions at all, please do not hesitate to get in touch.

Yours sincerely,  
Dr Laura Smith  
Publishing Editor, Journals

Royal Society of Chemistry  
Thomas Graham House  
Science Park, Milton Road  
Cambridge, CB4 0WF  
Royal Society Open Science - Chemistry Editorial Office

On behalf of the Subject Editor Professor Anthony Stace and the Associate Editor Professor Claire Carmalt.

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RSC Associate Editor:  
Comments to the Author:  
(There are no comments.)

RSC Subject Editor:  
Comments to the Author:  
(There are no comments.)

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Reviewers' Comments to Author:  
Reviewer: 1

Comments to the Author(s)  
The comment is given in the report.

Reviewer: 2

Comments to the Author(s)  
The article presents an interesting methodology for the synthesis of membranes, but some changes must be made as indicated below:  
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In the formula of Flux (F) superindices must be used.  
Reference 2 is incorrect.  
Reference 5 is incorrect.  
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Reference 36 is identical to the reference 1.  
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Reference 42 is incorrect.  
Reference 43 is incomplete.  
Reference 44 is incorrect.  
Reference 53 is incorrect, use subindices.

## Author's Response to Decision Letter for (RSOS-181294.R0)

See Appendix B.

## Decision letter (RSOS-181294.R1)

13-Nov-2018

Dear Professor Hernadi:

Title: Enhanced virus filtration in hybrid membranes with MWCNT nanocomposite  
Manuscript ID: RSOS-181294.R1

It is a pleasure to accept your manuscript in its current form for publication in Royal Society Open Science. The chemistry content of Royal Society Open Science is published in collaboration with the Royal Society of Chemistry.

The comments of the reviewer(s) who reviewed your manuscript are included at the end of this email.

Thank you for your fine contribution. On behalf of the Editors of Royal Society Open Science and the Royal Society of Chemistry, I look forward to your continued contributions to the Journal.

Yours sincerely,  
Dr Laura Smith  
Publishing Editor, Journals

Royal Society of Chemistry  
Thomas Graham House  
Science Park, Milton Road  
Cambridge, CB4 0WF  
Royal Society Open Science - Chemistry Editorial Office

On behalf of the Subject Editor Professor Anthony Stace and the Associate Editor Professor Claire Carmalt.

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RSC Associate Editor  
Comments to the Author:  
(There are no comments.)

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Reviewer(s)' Comments to Author:

## **Appendix A**

Referee report on the ms “Enhanced virus filtration in hybrid membranes with MWCNT nanocomposite” by Nemeth et al.

The work deals with fabrication and testing of carbon nanotubes (CNT) based composite filtration membrane for removing viruses from water. The filter consists of polytetrafluoroethylene (PTFE) and Multi-walled CNT decorated with various nanoparticles. The virus retention (MS2 bacteriophages) scaled with the % of CNTs and depended on the pH, as well. The best results were obtained with Cu<sub>2</sub>O-containing samples.

The starting materials and the filter were thoroughly characterized (x-rays, TEM, Raman, zeta potential), the parameters were varied in a broad range, there are no loose ends. The literature is well cited and the manuscript is very well written, the figures are nice. I am impressed by this work, it is one of the best I have read in this topic. I can fully support the publication of this work.

A follow-up work could be to test the filter performance under illumination. My guess is that the efficiency would increase, the number of “vital” MS2 bacteriophages would decrease, due to the hyperthermia pasteurization coming from the heating up of the CNTs with light, and the photocatalytic effect of nanoparticles. It is very likely, that filters decorated with TiO<sub>2</sub>

## **Appendix B**

Response to the comments of Reviewer 1

We thank Reviewer 1 for their careful reading of our manuscript. We are grateful for the positive feedback.

Reviewer 1: "A follow-up work could be to test the filter performance under illumination. My guess is that the efficiency would increase, the number of "vital" MS2 bacteriophages would decrease, due to the hyperthermia pasteurization coming from the heating up of the CNTs with light, and the photocatalytic effect of nanoparticles."

Author's response: We fully agree with Reviewer 1 on this matter. This proposition could potentially enhance the performance of our filter by several magnitudes, since more characteristics of the nanotubes would be exploited. Similar studies have already been conducted in our laboratory, and further experiments will focus on the illumination of the samples.

Response to the comments of Reviewer 2

We are grateful for the comments of Reviewer 1 for his/her careful reading of our manuscript, and their detailed comments that we have addressed. The modifications based on his/her comments greatly improved the manuscript.

Reviewer 2: "Sigma-Aldrich does not exist".

Author's reply: We agree that changes have been in place in the company structures, which today would suggest us to use Merck as distributor. However, the chemicals used in these experiments were ordered from the original Sigma-Aldrich company and thus the source of chemicals is correct as written.

Reviewer 2: "In the formula of Flux (F) superindices must be used."

Author's reply: The formula has been corrected accordingly.

Reviewer 2: comments on reference formats

Author's reply: We thank the Reviewer for his/her careful consideration of the Reference list, and the detailed description of mistakes in the references. We used the tools proposed on the website for reference editing, and all the points have been addressed in the revised manuscript.