

Interactive comment on “Fluorescence spectroscopy as a tool for determination of organic matter removal efficiency at water treatment works” by M. Z. Bieroza et al.

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Interactive comment on “Fluorescence spectroscopy as a tool for determination of organic matter removal efficiency at water treatment works” by M. Z. Bieroza et al.

Anonymous Referee #2

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This paper describes the use of fluorescence excitation-emission technique to organic matter characterization in drinking water. Fluorescence spectroscopy is an interesting technique for the characterization and quantification of OM fraction. It has possibilities

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to indicate the treatability of OM fractions in drinking water treatment, which is of interest for optimizing the operation of WTWs. Comments about the paper, are summarized below:

General comments:

1. Pay attention to the tenses in your paper. (This can also help to distinguish between your research and research from others, see my third comment.)

The comment was addressed in the following way: The text was checked for the use of tenses.

2. In this research methods used for OM are fluorescence spectroscopy, UV absorbance and TOC. Make sure you conclude only about results obtained with those measurements. Conclusions about molecular weight, hydrophobicity, etc can only be made on relations of these characteristic with fluorescence peaks concluded in other research.

The comment was addressed in the following way: See comment 31.

3. The last paragraph of the introduction does not make clear what exactly new research is. In the paragraph above is written what research is done, and DBPs formation is one of them. What makes this research different from the others? What exactly is the gap you are going to fill? How are you going to do that and what are your findings?

The comment was addressed in the following way: The paragraph was modified according to the above comments. Page 5 lines 17-20.

4. I miss something in the conclusions about section 3.2.

The comment was addressed in the following way: The main findings of section 3.2 were added to the conclusions. Page 13 line 15-20.

Specific comments:

5. pg 261 (1) ion exchange can be added for improving the organic matter removal efficiency. The comment was addressed in the following way: Ion exchange was added. Page 2 line 11.

6. pg 262 (13-14) What is the critique? Please summarize this.

The comment was addressed in the following way: The limitations of UV absorbance are described in the following paragraph. Page 4 lines 3-8.

7. pg 262 (24-27) The different methods are shown with their limitations. “: : : are of the greatest important” should become “: : :is not possible with the existing methods”.

The comment was addressed in the following way: The mistake was corrected. Page 4 line 12.

8. pg 263 (19) Remove TOC. TOC is a rapid indication of OM itself.

The comment was addressed in the following way: Removed. Page 5 line 15.

9. pg 263 (27) In Materials and methods, sample sites; I am missing the characteristics of these treatment plants and why you choose these. Please add this information.

The comment was addressed in the following way: A short explanation was added. Page 6 lines 3-4.

10. pg 264 (12) What about the variation in TOC and UV254?

The comment was addressed in the following way: A sentence describing the degree of TOC and UV254 variation was added. Page 6 lines 11-13.

11. pg 265 In Materials and methods, I am missing how you did the experiments. Please add a subsection “Experiments”.

The comment was addressed in the following way: Short description of the experiments was added. Page 6 lines 20-24.

12. pg 266 (5) Is Fig 2 representative for all WTW?

The comment was addressed in the following way: Yes. A short explanation was added. Page 8 lines 18-20.

13. Figure 2 Make clear which fluorescence EEM belongs to which treatment step; for instance, a= raw, b=post-GAC, etc.

The comment was addressed in the following way: Labels were added. Figure 2.

14. pg 266 (9) Reduction in TOC as measured as a peak C intensity: : .Why TOC?

The comment was addressed in the following way: Should read OM. Corrected. Page 8 line 14.

15. pg 266 (12) What is pre-contact tank stage?

The comment was addressed in the following way: The text was clarified. Page 8 lines 8-11.

16. pg 266 (22) show some data in a figure.

The comment was addressed in the following way: Table 1 was added.

17. pg 266 (28) the fluorescence intensity of which fraction increases?

The comment was addressed in the following way: The text was clarified. Page 9 lines 10-11.

18. pg 267 (4) so the tryptophan-like fluorescence peak will increase, show this.

The comment was addressed in the following way: See table 1.

19. pg 267 Consider moving the first two paragraphs of section 3.2 to the introduction.

The comment was addressed in the following way: The two first paragraphs of section 3.2 were modified (see comment 9, referee 1). Page 9 lines 18-25.

20. pg 267 (7-8) What do you mean by: The higher the removal, the more OM compounds is removed by coagulation? Is that not logical? What exactly is clarified water?

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Explain this in the materials and methods section.

The comment was addressed in the following way: The sentence was deleted. Paragraph was modified (see comments 6 and 21 , referee 1). Page 10 lines 1-6.

21. pg 267 (8) “compounds is” should become “compounds are”.

The comment was addressed in the following way: See the comment above.

22. pg 267 paragraph 1 and 2 give the same information. It is not clear if you conclude this from this research.

The comment was addressed in the following way: See comment 20.

23. pg 267 (19) figure 3 is not clear to me. I can not determine which dot belongs to which combination of C, T and TOC removal value.

The comment was addressed in the following way: Figure 3 was modified.

24. pg 268 (3) this correlation is not clear from figure 3. Please show this correlation.

The comment was addressed in the following way: See comment 23.

25. pg 268 (13) where did you state this?

The comment was addressed in the following way: The phrase “As previously stated” was deleted. Page 11 line 8.

26. pg 268 (18) I do not understand the reference. I do not find the relation in this reference. If it is in this reference, it is not new, so remove the reference or the whole paragraph.

The comment was addressed in the following way: Reference was removed.

27. pg 268 (25) you stated before that (p264 (9-12)) during 1.5 years only minor variations in treatment parameters occurred. A real-time monitoring tool is therefore not necessary. Rephrase this conclusion.

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The comment was addressed in the following way: See comment 10.

28. pg 269 (from line 13 onwards) Please explain your models more in detail. What are the equations used. I assume that the models are about OM removal by coagulation.

The comment was addressed in the following way: The models were described in more detail (see comment 13, referee 1). Page 12 lines 4-12.

29. pg 269 (13) “models of OM removal” should be “models of OM removal by coagulation”.

The comment was addressed in the following way: The description was added. Page 12 line 4.

30. pg 269 (from line 24 onwards). How many WTW were selected? How was the experiment performed?

The comment was addressed in the following way: The text was clarified. Page 12 line 24.

31. pg 270 (13-16) Your conclusion about the description of OM by fluorescence spectroscopy can not be made from the results of your research. It should be removed, see also my second comment by general comments.

The comment was addressed in the following way: The text was modified. Page 13 lines 15-12.

32. pg 270 (20-24) In your conclusions you explain more about your model than in the results, see also an earlier comment. Add this information on pg 269.

The comment was addressed in the following way: See comment 28.

Technical comments:

33. pg 261 (3) The heterogeneous character of organic matter: : .:

The comment was addressed in the following way: Corrected. Page 2 line 12.

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34. pg 262 (12) dissolved organic matter (DOC)

The comment was addressed in the following way: Corrected. Page 3 line 23.

35. pg 266 (2) "Trough" should be "through"

The comment was addressed in the following way: Corrected. Page 8 line 5.

36. pg 266 (20) Remove "complexity of"

The comment was addressed in the following way: Corrected. Page 9 line 3.

Interactive comment on Drink. Water Eng. Sci. Discuss., 2, 259, 2009.

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