

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 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:

-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.)

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-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 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?

-I miss something in the conclusions about section 3.2.

Specific comments:

-pg 261 (1) ion exchange can be added for improving the organic matter removal efficiency

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

-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”.

-pg 263 (19) RemoveTOC. TOC is a rapid indication of OM itself.

-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.

-pg 264 (12) What about the variation in TOC and UV254? -pg 265 In Materials and methods, I am missing how you did the experiments. Please ad a subsection “Experiments”.

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

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

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- pg 266 (9) Reduction in TOC as measured as a peak C intensity. . .Why TOC?
- pg 266 (12) What is pre-contact tank stage?
- pg 266 (22) show some data in a figure.
- pg 266 (28) the fluorescence intensity of which fraction increases?
- pg 267 (4) so the tryptophan-like fluorescence peak will increase, show this.
- pg 267 Consider moving the first two paragraphs of section 3.2 to the introduction.
- 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? Explain this in the materials and methods section.
- pg 267 (8) "compounds is" should become "compounds are".
- pg 267 paragraph 1 and 2 give the same information. It is not clear if you conclude this from this research.
- 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.
- pg 268 (3) this correlation is not clear from figure 3. Please show this correlation.
- pg 268 (13) where did you state this?
- 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.
- 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.
- pg 269 (from line 13 onwards) Please explain your models more in detail. What are

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- the equations used. I assume that the models are about OM removal by coagulation.
- pg 269 (13) "models of OM removal" should be "models of OM removal by coagulation".
 - pg 269 (from line 24 onwards). How many WTW were selected? How was the experiment performed?
 - 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.
 - 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.

Technical comments:

- pg 261 (3) The heterogeneous character of organic matter. . .
- pg 262 (12) dissolved organic matter (DOC)
- pg 266 (2) "Trough" should be "through"
- pg 266 (20) Remove "complexity of"

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