Drink. Water Eng. Sci. Discuss., 7, C42–C43, 2014
www.drink-water-eng-sci-discuss.net/7/C42/2014/

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Drinking Water Engineering and Science Discussions

Interactive comment on "Immobilized photocatalyst structure assuring optimal light distribution in a solar reactor" *by* A. S. El-Kalliny et al.

Anonymous Referee #2

Received and published: 28 March 2014

The subject of the paper is relevant as many knowledge gaps related to photocatalytic oxidation exist. The missing knowledge currently hinders full-scale application. The paper was comprehensively written and covers different aspects related to photocatalytic reactor design. Two different coating techniques were tested under different conditions and the catalyst composition was varied. Although the study has some important limitations (see further), the use of stainless steel grids as a support for TiO2 is novel. The paper is of sufficient quality to be considered for publication in DWES.

1) Drawbacks of the study are that 1) only very basic water matrices were tested (pure and HA spiked water), 2) no comparison was made with conventional TiO2 processes

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(suspended TiO2, conventional immobilization) and 3) limited research was conducted with respect to optimal grid configuration. Hence, it is difficult to prove the benefits of the novel configuration presented.

2) The title should be somewhat more specific. "Immobilized photocatalyst structure" sounds not very novel, while a specific and novel structure was used.

3) It was not clear to the reviewer why the authors did not conduct tests using "real" drinking water eventually containing organic micropollutants. This would have increased the potential impact of the paper.

4)The figures mainly present very basic results that were not really surprizing. E.g. the perfect model fit shown in Figure 9 could be expected as the Lambert-Beer law applies. Some figures (incl. Fig. 9) hence might be discarded.

5) Did the authors consider adsorption of HA's onto the TiO2? Could this have affected some of the outcomes? The concentration of HA's used was not justified. What is the unit of this concentration (mg carbon/L) and which HWhy does Figure 11 not contain measurements for a HA concentration of 3 mg/L?

6) The paper contained some (few) typo's: P67, line 23: "with increases the path length...", P68, line 1: "as high as practical capture", P70, line 22: "most possible small wire diameter"

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