

## ***Interactive comment on “Photocatalytic degradation of Dyes in Water by Analytical Reagent Grade Photocatalysts – A comparative study” by Dnyaneshwar R. Shinde et al.***

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Respected sir, We are thankful for reviewing the article and suggesting fruitful modifications. In following section we answered the queries of both referees and appropriate explanations were also included in revised manuscript.

Answers to Comments: Referee-1

Q.1: Page1.The abstract does not cover the main points of the manuscript. In the article, the photocatalytic activity experiments and results are foremost. I strongly suggest the author to rewrite it with logical organization. Ans: The abstract is modified in the

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revised manuscript according to suggestion given by the Referee.

Q.2. Page 10. You mentioned that “When rate constants represented in Table 1 are compared with percentage adsorption (Table 3), it is : : .”, Table 1 is XRD data, so the comparing is meaningless. Please revise it. Ans. Table numbers and captions are corrected and arranged properly in the revised manuscript.

Q.3. The photolytic degradations of dyes as control are not provided, which is very important for the mechanism analysis. For example, photosensitization is related with the light intake and photolytic degradation of dyes. Ans: Control experiments were carried out simultaneously. All three dyes selected in the study were found to be stable to light and pH in the control experiment. In revised manuscript it is mentioned clearly. Page -7: line -18 ff, page-9: line 1-2.

Q.4. The pH conditions of the experiments are not clear. If the pH means an initial pH, the change of pH during the experiments should be provided. Otherwise, the buffer solution used should be clarified. Ans: pH was adjusted initially. The pH was monitored during the experiments and found to be decreased up to  $8.6 \pm 0.1$ . Explanation of this part is provided in revised manuscript page-3: line -20.

Q.5. Page 10. 18th line. Should use “ZnO surface is loaded with silver metal” instead of “silver metal loaded on ZnO surface”. Ans: It is corrected in revised manuscript. The revised manuscript is language corrected from professional language editors (editing in India - Scholarly Editing and Translation Services Pvt Ltd –India). Page-10: line-17 Q.6 Page 2. 24th line. Should use “is reported to be responsible for the photocatalytic activity” instead of “are reported to be responsible for the photocatalytic activity”. Ans: It is corrected in revised manuscript. Page-2: line-20.

Q.7. Page 8. 26th line. Should use “needs a large amount of UV radiation to excite electron–hole pairs in this catalyst” instead of “and need a large amount of UV radiation to excite electron–hole pairs in this catalyst”. Ans: Corrections are made according to suggestion. Page-8: line-24. Q.8. Page 8. 27th line. Should use “Degussa

P-25 has the lowest band gap” instead of “Degussa P-25 have the lowest band gap”.  
Ans: Corrections are made according to suggestion. Page-9; line-2 Q.9. Page 9. 8th line, “and due to this it shows more photocatalytic activity than anatase”, sentence structure should be modified. Ans: Corrections are made according to suggestion. The line is modified in language editing. Page-9: Line-10-11 Q.10. Page 11. 21th line, should use “and helps to reduce rate of ” instead of “and help to reduce rate of..”. Ans: Corrections are made according to suggestion. Page-11: Line- 8- 9.

#### Answers to Comments : Referee-2

Q.1. General: Please have a professional technical English editorial office to proof read the manuscript and unify units (e.g. ppm and mg/L). Ans: The revised manuscript is language corrected form professional language editors (editing India - Scholarly Editing and Translation Services Pvt Ltd –India). Corrections in units are made.

Q. 2. The solar intensity variation with time and solar wavelength spectra should be given. Ans: time of the experiments and intensity of sunlight is mentioned clearly. Wavelength spectrum of solar radiations is not recorded but it is available elsewhere easily. Page-3, line-15,

Q.3. Why the authors chose flat slurry reactor (FSR) instead of closed container, which was used in most of literatures? Was the water temperature in FSR maintained? Ans: In present study we have utilized FSR, since it can be irradiated with external source of radiation such as sunlight. It provides large surface area and uniform depth of reaction mixture throughout the reactor. It is open to air hence provide more dissolved O<sub>2</sub> for chemical reaction. Annular slurry reactor or similar type of design may not be utilized in sunlight since they are internally irradiated and not suitable for external irradiation sources. Tubular reactor can be used in sunlight but it provides less surface area and uneven depth of reaction mixture in the vessel. Closed container reactor can provide less aeration hence less dissolved O<sub>2</sub> for chemical reaction. It is mentioned page page-3: line-21, page-7: line-15-16 Q. 4. Page 4, Lines 5-6: Was the solution pH

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maintained at 9? If not, the variation of pH value should be monitored. Ans: pH was adjusted initially. During the experiment it was decreased up to  $8.6 \pm 0.1$ . Page-3: line 20-21 Explanation of this part is provided in revised manuscript. Page -7: Line -18.

Q.5. Page 8, Line 15: The conclusion was hasty because the authors just investigated the photocatalytic activity at only one condition. Factors such as initial dye concentration, catalyst loading, irradiation time, pH and intensity of light should be considered. Ans: The conclusion part is revised according to suggestions.

Q.6. TOC analysis was suggested to help study the photodegradation performance. Ans: Our main aim of study is comparison of photocatalytic activity of metal oxides which is accounted in terms of the rate of decolourization. After decolourization sage COD was determined for the dye solutions treated with ZnO photocatalyst. For the dye solution treated with TiO<sub>2</sub>, Degussa P-25 and SnO<sub>2</sub> COD analyses were not performed as these catalysts displayed low catalytic activity. Separate section is added in revised manuscript. Page-11: line-25 ff and Support file, Table-3.

Q. 7. Please explain the significant difference of rate constants for three different dyes in Table 2. Ans: It is mentioned. Page-10: line-8. Q.8. Page 10, Lines 13\_14: "Table1" should be corrected to "Table 2". Ans: Table numbers and captions are corrected and arranged properly in the revised manuscript.

Please also note the supplement to this comment:

<https://www.drink-water-eng-sci-discuss.net/dwes-2017-20/dwes-2017-20-AC3-supplement.zip>

Interactive comment on Drink. Water Eng. Sci. Discuss., <https://doi.org/10.5194/dwes-2017-20>, 2017.

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