

Dear Editor and Reviewer,

We highly appreciate the detailed valuable comments of the referees on our manuscript of 'catalysts-1641068'. The suggestions are quite helpful for us, and we incorporate them in the revised paper. We have reconstructed the paper to improve the quality of our paper, and the major revisions were marked in red.

As below, on behalf of my co-authors, I would like to clarify some of the points raised by the reviewers. And we hope the editor and the reviewers will be satisfied with our responses to the comments and the revisions for the original manuscript.

Best regards,

Xinjiang Hu

Catalysts

NO.: catalysts-1641068

Title: Iron carbon catalyst initiated the generation of active free radicals without oxidants for decontamination of methylene blue from waters

Response to Reviewer 2 Comments

Point 1: The main findings (values) are recommended to be highlighted in the abstract.

Response: We appreciate the kind comment from the reviewer. The main findings (values) are recommended to be highlighted in the abstract, such as the removal time, and efficiency (in page 1, line 19-20).

Point 2: Equations 1-8 need to be supported with relevant references.

Response: Thanks for your valued suggestion. Three references, which we referred in our study have been added (in page 11, line 334).

References:

[45] X. Li, Y. Jia, Y. Qin, M. Zhou, J. Sun, Iron-carbon microelectrolysis for wastewater remediation: Preparation, performance and interaction mechanisms, Chemosphere, 278 (2021) 130483.

[46] J. Du, W. Guo, H. Wang, R. Yin, H. Zheng, X. Feng, D. Che, N. Ren, Hydroxyl radical dominated degradation of aquatic sulfamethoxazole by Fe(0)/bisulfite/O₂: Kinetics, mechanisms, and pathways, Water Res, 138 (2018) 323-332.

[47] G. Xie, H. Wang, Y. Zhou, Y. Du, C. Liang, L. Long, K. Lai, W. Li, X. Tan, Q. Jin, G. Qiu, D. Zhou, H. Huo, X. Hu, X. Xu, Simultaneous remediation of methylene blue

and Cr(VI) by mesoporous BiVO₄ photocatalyst under visible-light illumination, J Taiwan Inst Chem E, 112 (2020) 357-365.

Point 3: The correlation between structural and morphological findings and adsorption performance should be discussed.

Response: We thank the reviewer for the kind suggestion. The structure and morphology of Fe/NG catalysts are related to the adsorption/removal performance of the catalysts for MB. In SEM images, it was observed that different catalysts had different morphological structures, which greatly influenced the adsorption/removal of MB by the materials. The suggestions are quite helpful for us and we incorporate them in the revised paper. (in page 2, line 91-93).

Point 4: A table of comparison should be provided to show the importance of using this catalyst among the available materials.

Response: Thanks for your valued suggestion. Your suggestions have been taken seriously. We have produced a table showing the importance of using this catalyst in existing materials (in page 7, line 248-249, Table. 2).

References:

- [34] L. Wolski, M. Ziolk, Insight into pathways of methylene blue degradation with H₂O₂ over mono and bimetallic Nb, Zn oxides, Appl Catal B-Environ, 224 (2018) 634-647.
- [35] B. Zhou, X. Zhao, H. Liu, J. Qu, C.P. Huang, Visible-light sensitive cobalt-doped BiVO₄ (Co-BiVO₄) photocatalytic composites for the degradation of methylene blue dye in dilute aqueous solutions, Appl Catal B-Environ, 99 (2010) 214-221.
- [36] H. Ashrafi, M. Akhond, G. Absalan, Adsorption and photocatalytic degradation of aqueous methylene blue using nanoporous carbon nitride, J Photoch Photobio A, 396 (2020) 112533.
- [37] N.D. Trinh, S.S. Hong, Photocatalytic Decomposition of Methylene Blue Over

MIL-53(Fe) Prepared Using Microwave-Assisted Process Under Visible Light Irradiation, Journal of nanoscience and nanotechnology, 15 (2015) 5450-5454.

Point 5: Pore size distribution (from BET) should be provided even as an inset of Fig. 5a.

Response: We agree with the suggestion of the reviewer. Pore size distribution (from BET) has been re-provided. Furthermore, the details of pore volume have been re-revised in the paper (in page 6, line 193-194, Figure 5a).

Point 6: What is the nonstoichiometric ratio of Fe:C and how does it correlate with the EDX ratio.

Response: The EDX elemental content shows Fe=12.32 wt% and C=72.21 wt%, therefore Fe:C is approximately 17:100. In this paper the EDX test only shows the elemental content of the Fe/NG catalyst and is used to describe whether the Fe element is successfully loaded into the carrier material. However, you have provided a valuable suggestion on the performance of the catalyst.