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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Generation of hydrogen peroxide from San Joaquin Valley particles in a cell-free solution" *by* H. Shen et al.

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canastasio@ucdavis.edu

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Generation of hydrogen peroxide from San Joaquin Valley particles in a cell-free solution

H. Shen 1, A. I. Barakat 2, and C. Anastasio 1 1 Department of Land, Air and Water Resources, University of California, Davis, One Shields Avenue, Davis, CA 95616, USA 2 Department of Mechanical and Aeronautical Engineering, University of California, Davis, One Shields Avenue, Davis, CA 95616, USA

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Answers to Anonymous Referee #1

Q: Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Generally yes, but there are a few issues: Wang et al. 2010 cited in the paper should be included in the group professing that copper is a major contributor to ROS on pg. 21377 line 4. One could also argue that the text around line 19-23 would include more references to the ROS-Cu connection than just "Our findings" since others have also found this relationship. The fact that a handful of groups have reached the same conclusion from quite different angles strengthens the conclusion greatly.

A: We thank the reviewer for the comments. We've added a reference to the Wang et al. 2010 paper on pg. 21337 where we talk about copper as a major contributor to ROS. We also included some references to past in vitro and in vivo work showing a ROS-Cu connection to strengthen our conclusion (see Page 21338 lines 26-27).

Q: Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? A few clarificationsâËŸA ËĞTno combinations or eliminations.

Pg. 21337: last sentence of paragraph 1: if the values are valid (i.e. above the detection limit) being "small" isn't an explanation for a lack of a correlation when one is expected. I don't know what the explanation might be, but it doesn't seem reasonable to dismiss the lack of a correlation between copper and ROS formation for the Westside data set.

A: We agree with the reviewer that valid small values don't explain a lack of correlation. We removed the second part of the sentence ("but this is probably because the rates of HOOH formation are very small").

Q: 2nd paragraph pg. 21337 I think that a correlation in the field sample data between a transition metal and ROS formation is a necessary condition to support a link. Formation of ROS in a test tube from a solution of a purified metal salt adds power to the field observation, but absence of one does not negate it, as particles are very complex

and not necessarily accurately represented by simple solutions.

A: We believe that our quantitative approach is more useful than correlations in determining the importance of individual PM components for the cell-free production of ROS. However, we agree that the combination of the two approaches is even more powerful in examining the mechanisms for ROS production.

Q: Pg. 21340 line _15 point out that ascorbate isn't the only relevant reductant

A: "Asc is not the only reductant in human lung lining fluid" was added at the end of section 2.2.

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