Atmos. Chem. Phys. Discuss., 10, C8993–C8995, 2010
www.atmos-chem-phys-discuss.net/10/C8993/2010/

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.

Anonymous Referee #1

Received and published: 21 October 2010

After carefully reviewing this discussion paper, I have remarkably little to criticize or comment on. It describes interesting, novel and high quality measurements that will advance an emerging area, production of reactive oxygen species by ambient aerosols and probing of the potential relevance to induction of oxidative stress in lung tissues. I answer yes unequivocally to 13 of 15 of the questions posed reviewers by ACPD. Only two have a few caveats, as described below. I note that one is pressured to come up with at least a few constructive criticisms; otherwise the editors might think the reviewer hadn't actually read the paper. Over all, it is an excellent contribution. 1. Does the paper address relevant scientific questions within the scope of ACP? Yes, although it is at the interface of atmos chem and health effects research and might also be well suited to a more health effects related journal. 2. Does the paper present novel concepts, ideas, tools, or data? yes 3. Are substantial conclusions reached?

yes 4. Are the scientific methods and assumptions valid and clearly outlined? yes 5. Are the results sufficient to support the interpretations and conclusions? yes 6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Generally yes 7. 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.

8. Does the title clearly reflect the contents of the paper? yes 9. Does the abstract provide a concise and complete summary? yes 10. Is the overall presentation well-structured and clear? yes 11. Is the language fluent and precise? yes 12. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? yes 13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? A few clarificationsâĂŤno 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. 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. Pg. 21340 line $\sim$15 point out that ascorbate isn’t the only relevant reductant 14. Are the number and quality of references appropriate? yes 15. Is the amount and quality of supplementary material appropriate?

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N/A

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