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Atmospheric Chemistry and Physics Discussions

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12, C4347–C4351, 2012

Interactive Comment

Interactive comment on "Measurement of overall uptake coefficients for $HO_2 radicals by aerosol particles sampled from ambient air at Mts. Tai and Mang, C$

Anonymous Referee #2

Received and published: 5 July 2012

This is a very interesting and clever study to assess the role of ambient aerosols on the uptake of HO2. This study complements laboratory studies of HO2 uptake on laboratory generated one and two-component aerosols by extracting aerosols collected on filters with water and atomizing the mixture into the laboratory flow tube

apparatus. The study used levels of HO2 typical of lower tropospheric values but fairly large surface area densities in order to achieve HO2 decay rates easily measurable and able to be differentiated from the background decays. Various hypotheses are put forward to explain the observations that are reasonable and bring the laboratory studies and the present study into accord. The impacts of their observations on models of tropospheric chemistry are discussed indicating the importance of this process to reducing ozone formation rates and accelerating the aging of organic aerosols. Overall, this paper is quite good and should be published. I have some minor comments and questions that the authors may wish to consider in the preparation of the final version of the paper.

Page 13788. Abstract, line 1. Suggest "collected on quartz fiber filters. . ." Line 6. Suggest "For 10

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samples,. . .” Line 7. Suggest “Mt. Tai site ranged from. . .” Line 10. Suggest “. . .suggesting that reactions with minor components. . .” Line 12. Suggest “. . .could significantly affect atmospheric HOx concentrations. . .” Introduction, line 20. Suggest “. . .radicals have been made recently. . .” Line 21. Suggest “. . .from these measurements are lower than. . .” Line 24. Suggest “This indicates the possible presence of missing loss processes for HO2.”

Page 13789, line 22. Suggest “This result implies that. . .”

Page 13790, line4. Suggest “. . .chemical evolution of particle composition. . .” Line 9. Suggest “. . .they hypothesized the importance. . .” Line 16. Suggest “. . .in China, in laboratory experiments. . .” Line 17. Suggest “. . .of HO2. We determined overall HO2 uptake coefficients for

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realistic. . .” Line 20. Suggest “. . .processes on tropospheric chemistry.” Line 25. Suggest “. . .as part of intensive field campaigns. . .”

Page 13791, line 19. Suggest “. . .by photochemical processes during the daytime.”

Page 13792, line 4. Suggest “. . .prior to the experiment.” Line 20. Suggest “. . .into pieces and the loaded particles. . .”

Page 13793, line 20. Suggest “. . .dry air flow with a flow of air that had been passed through a water bubbler.”

Page 13795, line 24. Suggest “. . .Eq. (4), gas-phase diffusion has not. . .”

Page 13796, line 4. Suggest “. . .from a least-squares fit. . .” Line 14. Suggest “. . .the uptake coefficient should be < 0.01 under tropospheric. . .” Line 19. Not sure if “scavengers”

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is the right word. “catalysts” might be better.

Page 13798, line 1. Suggest “. . .estimate the uptake. . .” Line 15. Suggest “. . .similar, that being 0.01-0.3%...”

Page 13800, line2. Suggest “. . . which we present here. . .” Line 11. Suggest “. . .airborne study of aerosol. . .”

Page 13801, line 3. You might explain why you picked 10% in this discussion.

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 13787, 2012.