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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Predominance of Secondary Organic Aerosol to Particle-bound Reactive Oxygen Species Activity in Fine Ambient Aerosol" *by* Jun Zhou et al.

Anonymous Referee #3

Received and published: 14 August 2019

This manuscript discusses interesting and significant work that relates to real time PB-ROS measurements for particles collected from field campaigns and laboratory studies. The authors apportion the ambient PB-ROS to different OA sources and the results are further supported by laboratory chamber studies. The findings are important, and the manuscript is well written. I recommend that it can be published following some revisions.

1. Both field campaigns were not conducted in warm seasons, it may be too early to connect PB-ROS to elevated incidence of adverse effects in warmer seasons.

2. OA sources from PMF is based on online ACSM or AMS data. But the PB-ROS

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measurement is from water soluble fraction of the aerosol. Should the solubility of each OA factor be considered when attribute their contribution to the PB-ROS?

3. Line 145: “Transition metals and quinones that induce redox cycling and are well measured by the DTT assay do not react or interfere with DCFH when present at typical ambient concentration levels.” Did the author do some tests and conclude it? If yes, please show which transition metals and quinones did the author test? Different quinone or transition metal species can show varying sensitivities. This has been found for DTT assay (Charrier et al., ACP 2012). Also, it is known that transition metals and quinones in aqueous solution can form H2O2, which is very sensitive to DCFH. Since the authors did not see any DCF signal, does it mean the formation of H2O2 is too low or due to the mixing time of transition metals and quinones with water is too short?

Minor comment:

1. eBCWB and eBCTR are not defined in the manuscript

2. Fig S7a, use “OA” in both x and y axis labels.

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