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Interactive comment on “Effect of atmospheric ageing on volatility and ROS of biodiesel exhaust nano-particles” by A. M. Pourkhesalian et al.

Anonymous Referee #2

Received and published: 10 June 2015

The study is systematic and well-made and the results are interesting and new.

Some issues are listed below. Some of them should give rise to revision of the manuscript. The comments are in addition to the comments by anonymous referee #1.

Major comments:

- Why was not any technique for chemical characterization used in this study? Information of chemical composition would be useful in order to understand potential toxic properties. Thermo-optical analysis of organic and elemental carbon would also have been useful to see whether the increased volatility comes from increased fraction of organic aerosol.

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- The R²-values should be given for the regressions lines in the figures.
- The paper gives too little conclusive evidence that biodiesel aerosols might be more toxic and that the overall toxicity depends on the fuel. Only ROS-experiments have been performed. You should look at more toxicity endpoints before stating conclusions about overall toxicity
- You should state a cumulative OH-exposure or a similar measure for you experiment, not just make an approximation of the atmospheric aging based on the literature.
- In the abstract it is stated that the chemical composition of the exhaust changes upon aging, it is very likely, but since the chemical composition is not determined, this cannot be concluded.
- The engine itself EURO3 is rather old and it is also not clear whether there is any device for exhaust after treatment connected in your setup. Are the results relevant for the newer vehicles with exhaust after treatment that is used nowadays? I should be stated in the test that this might not be the case. Also have you tested your setup with other engines, do you see the same results?
- The DustTrak measures scattered light from particles. The masses are only indirectly derived from light intensity. It is not correct to express these measurements as mass determinations. They are just relative in arbitrary units.

Minor comments

- The shaded areas in figures 4, 6 and 8 needs to be explained in the caption.
- I do not like acronyms in the title. I prefer that “ROS” is expressed Reactive Oxygen Species until it is explained in text. I am not sure that all the readers of ACPD immediately associate “ROS” with these types of species.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 6481, 2015.