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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Formation of hydroxyl radicals from photolysis of secondary organic aerosol material" *by* K. M. Badali et al.

Anonymous Referee #2

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General

This is a very interesting contribution by the group of Jon Abbatt which identifies OH formation from SOA, apparently for the first time. The photolytic OH production appears logical as SOA contains organic hydroperoxides and particle containing SOA as well contain H2O2. It is deduced that rather ROOH than H2O2 causes the OH production. An absolute quantum yield of OH production is provided.

A very interesting and substantial contribution which clearly merits publication in ACP.

Details

Page 7, line 15ff: It would be great if the authors could explain why the decided for the

chosen technique for peroxide determinetion as literature describes different methods, cf. page 4, lines 18/19.

Page 8, line 2.4.: Apparently, BA as a OH scavenger together with the detection of PHBA seems to be a good choice when this product can only be formed when OH reacts with OH. Are there any additional pathways which can leadt to th eformation of PHBA ? What can happen if a one-electron oxidation of the aromatic forms a radical cation which then reacts with water ? Can alternative pathways for the formation of PHBA be excluded ? Maybe this can be discussed to some extend.

Page 10, line 21ff: Doesn't this discussion call for an alternative technique of peroxide determination with a method which does not show such a strong sensitivity for H2O2 compared to ROOH ?

Page 14, line 13ff: The deduction of an absolute quantum yield is great and very helpful for future modelling.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 4117, 2015.