

Interactive comment on “Halogenation processes of secondary organic aerosol and implications on halogen release mechanisms” by J. Ofner et al.

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The authors thank referee #2 for the friendly acknowledgement of our experimental study and for his specific comments, demanding explanations for the observations in terms of reaction mechanisms.

We have added a section within the discussion to reflect basic organic halogen reactions and discuss them in the content of the paper. We decided to add no further figure, because the heterogeneous reaction of RHS with the organic aerosols will not start with the basic precursors but with the already by ozone and OH processed compounds. The aerosol formation from catechol and guaiacol by ozone and OH has been discussed by Ofner et al. (2010, 2011) and a realistic scheme will be too complex and mainly speculative, so we simply describe the relevant reactions. Furthermore, the

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chosen methods are not suitable to determine single reaction pathways, but to obtain a general roadmap of physicochemical transformation (as mentioned in the conclusions). The new subchapter was included within the supplement of this comment.

Addition to the conclusions: The entire organic aerosol is processed by the main gaseous halogen species like X₂, HOX, and HX. These species are able to change the chemical structure of the organic backbone by hydrogen abstraction or saturation of unsaturated carbon-carbon bonds. Further, functional groups are affected by the halogens. Abstraction of hydrogen atoms from alcohols or aldehydes and decarboxylation are possible reaction pathways during the degradation of the organic matter of the aerosol. Gas-phase as well as liquid-phase halogen chemistry involving atomic and heterolytic splitted species seems to take place during the reaction of RHS with SOA. However, other methods like time-resolved aerosol flow-reactor spectroscopy are needed to figure out single and important degradation pathways in more detail and clarify the major processes during the complex aerosol halogen interaction.

Page 2983, 22: medium was changed to mean

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/12/C3175/2012/acpd-12-C3175-2012-supplement.pdf>

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 2975, 2012.