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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Photoinduced oxidation of sea salt halides by aromatic ketones: a source of halogenated radicals" *by* A. Jammoul et al.

Anonymous Referee #4

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The manuscript of Jammoul et al describes laboratory experiments aimed at investigating the potential of organics to play a role in halogen cycling, through the photoinduced oxidation of halides to halogen radicals. This could play an important role in the chemistry of the sea-surface microlayer, interactions with the overlying boundary layer, as well as sea-salt aerosols.

The work is interesting and analytically sound and worthy of publication, given a few relatively minor changes. This work will be of interest to a number of disciplines, including atmospheric chemists and perhaps also biogeochemists interested in organic matter cycling (as the alteration of DOM by this chemistry could be important to the

reactive character of this material at the sea surface).

Specific comments:

1) Page 7682, line 20-22: "such a complex chemical mixture is naturally reactive and its decomposition leads to the formation of a variety of functional groups such as carbonyl and carboxylic acids". This statement is somewhat misleading. It reads as though the carbonyl/carboxylic acids were not present in the dissolved organic matter and are only formed through decomposition processes ... however carbonyls are certainly present in DOM, in materials such a humic and fulvic acids that make up DOM. I suggest rewording.

2)Page 7683, second paragraph: In the discussion of the Arctic halogen chemistry, it is important to also include that a lot of the chemistry is now presumed to occur in sunlit snowpack, not just sea-salt aerosols (these alone have been shown inadequate to account for the halogen production observed in the Arctic during polar sunrise). See the discussion of Arctic halogen chemistry by Simpson et al, ACP, 2007.

3) Page 7686 line 10: the correct units are 18 M-ohm cm (Millipore) water.

4) Page 7687: It might be useful to include (perhaps as an inset to a figure) a spectrum of the emission of your UV lamps.

5) Page 7687, line 6: "This is a crude but efficient way ..." I don't usually associate the word crude with efficient. Which is it? What makes it crude, but yet simultaneously efficient? Consider rewording, or describing what you mean by the qualification "crude".

6) It would be useful to include discussion of any blanks that you ran (i.e. experiments without BP), just to make readers aware that none of the detected signals could possibly arise from any type of background contamination, or carry-over from one experiment to the next. You make a point to state that the lines were glass or PTFE for "clean" liquid flow, so that implies there could be issues you need to address if

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that flow somehow becomes contaminated or subject to carry-over from experiment to experiment. Suitable blanks allow you to address this.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 7681, 2009.