Response to Editor's comments

We thank the editor for the quick decision. Our reply to the comments is below in blue.

Editor's comment:

The authors might consider describing in a bit more detail how IEPOX-SOA and glyoxal SOA were modeled. For IEPOX, they might describe whether their dependence on aerosol liquid water, acidity, particle sulfate, chloride, NH4 content was accounted for. Was cloud chemistry of IEPOX and glyoxal SOA included?

We have extended the model description as follows:

We use a simplified model for the aqueous formation of SOA from IEPOX and glyoxal, similar to what was used by Mielonen et al (2018). For partitioning the IEPOX and glyoxal to aqueous phase we account for the liquid water amount, and to account for the "salting-in" effect (Kampf et al., 2013), we use higher effective Henry's law constants for aerosol than for cloud and rain droplets. For glyoxal we apply the effective Henry's law constants from Kampf et al (2013). The ionic strength has been reported to have an impact also on IEPOX uptake (Gaston et al., 2014) but its magnitude has a large uncertainty. Thus, for aerosol phase we use the measurements of Nguyen et al. (2014), and for cloud droplets and rain we have lowered the value to 10^5 M atm^{-1}, same as used by e.g. Jo et al. (2019). As the background aerosol defined by Ackerman et al. (2009) for this case study is a simplified proxy that consists of pure ammonium bisulfate and does not reflect the complexity of real marine aerosol, we do not account for particle composition in more detail. The model does not include any aqueous phase chemical reactions or irreversible processes. Gas phase oxidation reactions of IEPOX and glyoxal are included and are listed in Table S1 in the Supplemental Material.

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