

Interactive comment on “Influence of urban pollution on the production of organic particulate matter from isoprene epoxydiols in central Amazonia” by Suzane S. de Sá

Anonymous Referee #2

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This is compelling and well written paper, describing observations to elucidate the role of anthropogenic nitrogen oxides and sulfate on the formation of biogenic “IEPOX SOA”. The measurements are robust: the identification of IEPOX SOA from PMF factors is grounded in isoprene oxidation tracers. The analysis is carefully considered, and two golden days in which the Manaus plume intercepted the Amazonian field site are used to evaluate the impacts of anthropogenic pollution on the development of SOA over the rainforest. The authors find that IEPOX-SOA increases with sulfate, but once that is controlled for by binning into ‘high’ versus ‘low’ sulfate, IEPOX SOA also decreases with NO_x exposure. This is consistent with our mechanistic understanding of isoprene oxidation and SOA formation in low NO_x environments. Finally, the authors

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use a Lagrangian model to demonstrate that the effect of NO_x is really to reduce IEPOX SOA production, rather than to increase loss rates. I recommend publication with very minor corrections.

A few points for the authors to consider:

1. The authors describe that sulfate has both background and urban sources, while NO_x has just urban sources, complicating the use of sulfate as an anthropogenic tracer (line 374). To what extent do background sources really impact sulfate? (i.e. can the authors quantify this?). I am surprised that sulfate formation from MSA and such would be enough to actually complicate the analysis.
2. The premise of the paper is the relative rate for the ISOPOO radical (an RO₂ radical) to react with HO₂ versus NO. It may be useful to actually calculate that ratio (so $k_{RO_2+HO_2} [HO_2]$ versus $k_{RO_2+NO} [NO]$) as a function of NO_x. I would anticipate that this ratio maximizes IEPOX SOA formation at the same NO_x concentration as the observations show.

Technical comment:

Line 459. I think you mean “model” instead of “mode”.

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-1020, 2016.

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