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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Secondary Organic Aerosol from Atmospheric Photooxidation of Indole" *by* Julia Montoya et al.

Anonymous Referee #2

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General comments

The paper reports secondary organic aerosol (SOA) yield, mass absorption coefficient (MAC) values, and light-absorbing compounds in SOA produced from photooxidation of indole. High SOA yield was observed and several compounds (i.e. -heterocyclics) were found to absorb visible light. Additionally, an air quality simulation was used to evaluate the contribution of indole-SOA to total atmospheric aerosol in South Coast Air Basin of California (SoCAB) area. The estimated indole-SOA mass loading in SoCAB was low. Nevertheless, due to its high MAC values and SOA yield, indole-SOA has potential to degrade visibility during springtime flowering events in areas with less black carbon influence. The topic of this study fits within the scope of the Atmospheric Chemistry and Physics journal. Also, the SOA formation indole photooxidation as demonstrated by this study can improve SOA model and reduce the gap between model and measurement.

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Discussion paper

The paper is written well and there are only a few typing errors. I recommend publishing the paper after minor revisions as detailed in the following.

Specific comments

1. Introduction Emission factor or mixing ratio of indole should be discussed to provide a context of the importance of studying SOA formation from indole. Thus we can compare whether indole is as atmospherically relevant as other biogenic VOCs, for example, monoterpenes and isoprene.

2. Methods

a. Pg. 4 Lns. 28-31: is solubility of the light-absorbing compounds similar in both acetonitrile and methanol? For example, isatin has been shown to have different solubility in a set of organic solvents (Liu et al., 2014). Would different solubility affect your results and discussion?

b. Pg. 5 Ln. 7: are the additional samples coming from the same set of experiments or from different experiments with similar conditions? Please clarify.

3. Results and discussion

Fig. S2.3: 2-formylformanilide and isatin rose slightly after injection of indole before oxidation, and the increase were intensified after the chamber lamps were turned on. Is it possible that it was formed by reaction of indole with existing OH in the chamber? How clean was the chamber prior each experiment?

Technical comments

Pg. 8 Ln. 22: Delete "#3725"

Pg. 9 Ln. 19: . . ..MW = 262 Da)

Pg. 10 Lns. 20-21: . . .dihydro. . .

Pg. 11 Lns. 12-14: A diurnal profile of indole would be useful here.

Fig. 8: Caption “. . .dihydro indigo dye. . .”

References

Jin-Qiang Liu, Si-Yu Chen, and Baoming Ji, Solubility and Thermodynamic Functions of Isatin in Pure Solvents, Journal of Chemical & Engineering Data, 2014, 59 (11), p.3407-3414, doi: 10.1021/je500396b

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