Response to Anonymous Referee #2

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.

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:

2.1 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.

In addition to the literature review on the emission sources of indole that was already included in the introduction section, we have added additional references dealing with emissions of indole from animal husbandry (see response 4.1 to reviewer #4).

2.2 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?

Based on visual inspection, the samples appeared to dissolve fully in both acetonitrile and methanol. If we use isatin as an example, then our solutions are at least 80 times more dilute than the molar solubilities reported for acetonitrile (Liu et al., 2014) and methanol (Baluja et al., 2013). More clarification was added in section 2, paragraphs 3-4.

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

More detail was added in the experimental methods section to clarify that additional samples were obtained from separate experiments run under the same conditions (section 2, paragraph 1).

2.4 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?

It not possible that 2-formylformanilide and isatin formed by an OH reaction before the lamps are turned on, because there is no OH in the chamber without lights. For example, monoterpenes do not get oxidized in our chamber unless lights are on. It is conceivable that indole is more sensitive to oxidation by oxygen or hydrogen peroxide present in the chamber. The SDS (Sigma Aldrich, 2014) for indole

indicates that indole is sensitive to light and air, so it may oxidize to some extent even in the absence of UV lights.

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

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

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

Fig. 8: Caption ". . .dihydro indigo dye. . ."

All fixed, thank you for pointing out these typos.

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

Diurnal profiles (Figure S5) have been added to depict the domain wide average concentrations of indole and the domain maximum concentrations of indole.

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

This reference has been added.