

Comments to Jiang et al EGUsphere 2023:

This manuscript by Jiang et al. explores chemical composition, formation mechanisms and optical properties of ind-SOA BrC produced from oxidation of indole in an environmental chamber at atmospherically relevant conditions with/without NO₂. They observed that in the presence of NO₂, the SOA yields decreased by more than a factor of two but the mass absorption coefficient of ind-SOA BrC at 365 nm was 5 times higher as compared to the ind-SOA BrC formed without NO₂. The global emissions of Indole is half of one of the most abundant amines, i.e., trimethylamine. Despite its significant presence in the atmosphere, the chemical composition, formation mechanism, and optical properties of ind-SOA including its BrC remain poorly understood. The study is valuable for atmospheric chemistry and climate modelling community, particularly for areas with high Indole emissions, such as animal husbandry, maize and rice fields and tea manufacturing areas. This manuscript is well written, well-presented, and could be accepted for publication after considering the following comments:

Line 85-90: How did you make sure that there was no interaction between methanol/indole mixture? How will the volatilization of methanol affect wall losses? Did you do blanks? Please elaborate.

Line 90: Did you use any tracer for OH concentration calculation? If yes, what tracer? Add a brief discussion about OH concentration calculation.

Section 3.2 (Line 195-210): You have used acetonitrile extracted ind-SOA BrC in UPLC-PDA analysis (section 3.3). However, BrC extraction efficiency in methanol and acetonitrile could be significantly different from each other. Why did you not compare ind-SOA BrC optical properties in methanol and acetonitrile?

Line 205-210: The MAC values in REF and AS were similar between online-PAS and offline-Aqualog measurements but not for AS-NO₂. Why, elaborate?

Figure 4: How did you calculate the fraction of individual chromophores (known, unassigned, unresolved) to total ind-SOA absorption? Add a brief discussion.

Figure 4c: Typo-error "Unassigned"

Line 283: "However, in presence of NO₂, a significant shift occurs, and 3-nitroindole becomes the dominant compound, comprising up to 76% of the chemical composition." I think it's 76% of the total CIMS species, not the total composition.