

Interactive comment on “Chemical composition, structures, and light absorption of N-containing aromatic compounds emitted from burning wood and charcoal in household cookstoves” by Mingjie Xie et al.

Anonymous Referee #3

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General comments:

This manuscript is a nice piece of work describing the emission of nitrogen containing aromatic compounds (NAC) from the use of cookstoves. The authors aim to understand the contribution of these species to the light absorption of organic matter in PM_{2.5} at the wavelength of 365 nm. The authors found that much higher contribution of NAC light absorption to PM_{2.5} in quartz fiber backup filters than in PTFE front filters, suggesting that NAC may be an important group of light absorbing compounds in the gas phase. In addition, the authors found the NAC compounds targeted in this

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manuscript ($M_w < 300$) are less important for the light absorption of PM_{2.5} bound organic matter at least from cookstove emissions, and indicate that larger molecules with $M_w > 500$ are responsible for the light absorption of organic matters. The manuscript is well written, and I recommend publication of this manuscript after addressing minor technical corrections outlined below.

Specific comments:

If it is possible, the authors should present all NAC in emission factors (g kg^{-3}) rather than in mass concentrations ($\mu\text{g m}^{-3}$). Emission factors are more useful than mass concentrations as they can be used for emission control strategies directly.

Line 171: $\text{ng } \mu\text{L}$ should be $\text{ng}/\mu\text{L}$ or $\text{ng } \mu\text{L}^{-1}$.

Line 214 onwards: This assumes that the backup quartz fiber filter can trap all the gas phase compounds and does not have a breakthrough at all. A better way to estimate the artifact of a filter sampling system is to utilize a denuder in front of a PTFE filter for gas sampling and place a quartz fiber filter after the PTFE to correct a negative artifact from blown-off. It would be good if the authors discuss briefly here about the potential usage of the denuder for the artifact correction in addition to the backup quartz fiber filter.

Line 283: In Table S3, the authors suggest $\text{C}_8\text{H}_5\text{NO}_2$ as 3-cyanobenzoic acid. This is commercially available from several chemical suppliers, and it can be positively identified if $\text{C}_8\text{H}_5\text{NO}_2$ correspond to the authors' suggestion. I ask the authors to purchase the standard compound and quantify it instead of using a surrogate compound.

Fig S5: The mass spectrometric conditions and ionization methods used to obtain MS2 spectra for some compounds shown in Fig S5 are very different from ones shown in Fig S4, and they are not comparable at all. I ask the authors to remove those (EI and ESI+) from Fig S5 as they cannot be compared to each other.

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ACPD

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