

Authors: Zhang et al.

Particulate organic nitrates in eastern China: variation characteristics and effects of anthropogenic activities

General comments

This work conducted comprehensive analyses for organic nitrates in ambient PM_{2.5} samples. The authors take advantage of the availability of PM_{2.5} samples collected in four different sites in China and aim to identify major influential factors on organic nitrates formation in the different atmospheric environments through examining correlation relationship with organic nitrates and some co-emitted species.

However, this manuscript is just simply reporting the semi-quantified data of organic nitrates without any convincing and direct evidence to show the influence of anthropogenic pollutants to organic nitrates. This paper just provided non-robust discussion to support the previous reported results without any creative design and idea. Although the authors have the data from four different sites, the limited sample numbers cannot provide typical seasonal or diurnal information. They need a large dataset to prove their conclusions. Therefore, based on the significant weaknesses described above, publication is not recommended.

Specific comments

1. Line 114: Please provide sample numbers for each sampling site.
2. Line 176: The author mentioned that they employed surrogates to semi-quantify organic nitrates. The employment of surrogates that even don't contain the nitrooxy group would introduce large uncertainty for accurate quantification of organic nitrates because the different functional groups can introduce large differences for MS response. The authors even used different surrogates for different kind of organic nitrates but compared with the data together. The authors should find some methods to decrease the discrepancy or try to evaluate the uncertainty.
3. Line 184, the authors provided the recoveries for surrogate standards with only 60%. Based on my knowledge, the recoveries should in +- 20% to prove the effectiveness of an extraction method.

4. Line 188, please provide the comparison chromatogram between LC/orbitrap MS and LC/Iontrap MS.
5. Line 215, it mentioned: “ increased emission of BVOCs in summer facilitated the secondary formation of PONSs.” It’s better to show some VOCs data, including such as isoprene, monoterpene and etc. If the authors didn’t have detected data for their sites, maybe they can find some reported data near their sites. Still, the very limited number of samples in DY summer and winter may difficult to provide typical seasonal contrast (N~15). Because based on some work on monoterpene derived organosulfates, the formation of them may be more related to anthropogenic pollutions with a higher level in winter than in summer.
6. Line 243, the author detected the higher concentration of OAKN 359 (~100 ng/m³), OAHN 361 based on surrogate standard and got the conclusion that significant influence of cooking and oil processing on the SOA in urban and rural areas in eastern China. First, the authors don’t know the difference of MS response; therefore, it is possible that these compounds can have the large MS response but deficient concentration. Second, it’s better to provide the MS/MS spectrum to prove MW 359 and MW 361 compounds share the same carbon skeleton with oleic acid.
7. In section 3.3.1, the author showed a strong correlation with SO₂ and LDKN 247 and got the conclusion that SO₂ promotes the formation of LDKN 247 through limonene CIs. First, please exclude the possibility of transportation that can lead to the strong correlation as well. Second, MW 247 organic nitrates can form from β-pinene (Clafin and Ziemann, JPCA, 2018) with two carbonyl groups, one hydroxyl group and one nitrooxy group. However, there’s no research reported the β-pinene could react with SO₂ or O₃ to generate CIs. And the emission of β-pinene is larger than limonene.
8. Line 354, please provide the previous research to support that BB can lead to more VOCs emission.
9. Figure 5, “LDKN248” should be “LDKN247”
10. Figure 9(a), the number of blue points is 9. (b) the number of blue dots is 10.
11. Table 2, “(MW = 295, PSON 295” should be “(MW = 295, PSON 295)”