

Comment on acp-2022-468

Anonymous Referee #2

Referee comment on "Comprehensive characterization of particulate intermediate-volatility and semi-volatile organic compounds (I/SVOCs) from heavy-duty diesel vehicles using two-dimensional gas chromatography time-of-flight mass spectrometry" by Xiao He et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2022-468-RC1>, 2022

I thoroughly reviewed this manuscript. I agree that the subject of the review is very essential. This paper presents the characteristic of the particulate I/SVOCs from chassis dynamometer tests of HDDVs complying with multiple emission standards. Interestingly, this paper provides a versatile approach and could be applied into other significant sources prevailing in typical environments. This may have implications for environmental management. I have listed some specific comments (see below) for this paper, and it is recommended to make revision before publication.

- EF and OA in Line 30. These abbreviations have to be explained in their first appearance in the text. Check throughout the manuscript. These are readily recognizable only to the more experienced reader.
- In Introduction, from Line 36 to Line 42, so much dated references are cited, such as: Line 38, Lines 39-40, Line 42. A better presentation is needed along with up-to-date references. The Introduction should be rephrased.
- Lines 77-78. You expressed "a comprehensive characterization of speciated g-p partition of vehicle emission is yet to achieve". However, there is no reference, please give some to confirm it.
- The format of the paper still needs to be improved. Such as, Line 80: "integrate" and Line 145: "Nest". Please modify it.
- Line 164. You said " w_c is the mass fraction of carbon (0.86) in the diesel fuel". How do you get this value 0.86? There is not any analysis about the reason or any reference to support it.
- Line 173. The sentence "alkane is the most abundant species" is not smooth. Please confirm words "is" and "species" are conflict whether or not?
- Line 173-175. The two sentences expressed similar idea. It is recommended that they can be combined into one part.
- Lines 190-198. This chapter you gave the results about EF. Lines 173-189, the average HDDV-emitted particulate I/SVOCs EFs of cold-start and hot-start driving cycles are expressed, respectively. However, you do not distinguish the results about cold-start and hot-start in Lines 190-198. Please give an explanation.
- Line 225. What is the meaning of O-I/SVOCs? You analyzed volatility distribution of

I/SVOCs before. What is the difference between O-I/SVOCs and I/SVOCs?

- Lines 266-269. There is some confusion regarding what you refer as the respective fractions. You gave three ratio change results under W_cold condition and W_hot condition. However, what do the three ratio change results correspond to, P1, P2, P3 or may be P3, P2, P1...? Please write it clearly.
- Line 309. The same as Q5. The sentence "The particle fraction decreases to less than 1% between $\log_{10} C^* = -1$ to $2 \mu\text{g m}^{-3}$ " is not smooth. Please modify it.