Review for "Enhanced emission of intermediate/semi-volatile organic matters in both gas and particle phases from ship exhausts with low-sulfur fuels" by Xiao et al.

In this study, the authors estimated the emission factors of speciated and unspeciated I/SVOCs from ocean-going vessels and inland cargo ships with different fuel types, engine types and operating conditions. They found that the emission factors of I/SVOCs increased as the sulfur content in fuels decreased. Although the methods, analysis, and results are not particularly novel which was built on previous studies of IVOCs emissions from vehicles (Zhao et al., 2015, 2016), the measurement data presented in this study are very helpful for estimating SOA formation from ship exhausts. I recommend the publication of this work after the authors could address my comments below.

Major comments:

(1) My major concern lies in the representation of volatility distributions. Though I totally understand that the authors classified volatility based on carbon numbers (Lines 188-194), following the methods in Zhao et al. (2015, 2016), I strongly recommend the authors can plot volatility distributions using the volatility basis set (VBS) framework (Donahue et al., 2006), similar to Figure 2 in Zhao et al. (2015) and Figure 4 in Zhao et al. (2016). The VBS framework is widely used in air quality models for simulating SOA formation. Representing volatility distribution within this framework would provide essential information for inputting the measured data into chemical transport models in future studies.

(2) My second major concern is related to the method used for calculating SOA formation in Section 2.5 and the SOA formation potential (SOAFP) showed in Fig. 7. As shown in Eq. 3 in Line 218, the formed SOA is a function of reacted precursor concentration [HC], oxidation time, and assumed OH concentrations. I am very confused how the authors derived the SOAFP in Figure 7 without providing details on the amount of precursor reacted, oxidation time, or OH concentrations. Please refer to Figure 5 in Zhao et al. (2016) and include more detailed information on how SOA formation was calculated in this study. Furthermore, it would be helpful to compare the SOA production from ship exhausts with previous studies (Morino et al., 2022; Zhao et al., 2015, 2016). Is the SOA production from ship exhaust higher or lower than SOA formed from vehicle exhaust?

Specific comments:

The writing quality needs some improvement. Several sentences would benefit from commas instead of periods. For instance, a comma should be used after "detection methods" in Line 449. I also recommend that the authors pay closer attention to the use of conjunctions throughout the manuscript to enhance readability and clarity.

References

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