1. In response to Reviewer 1's comment #2, instead of just noting that "The mass fraction of molecular components in all three fuels used in this study can be found in Table S4" in the manuscript, I suggest incorporating the response in the revised manuscript to provide context. Please also specify the % of alkanes+alkenes vs. aromatics for F2 and F3 (based on Table S4) in the revised manuscript.

We thank the editor and reviewer for this comment. Table S4 here just provides extra information of the fuel content in molecular level (49 molecular species). But to response the reviewer and editor's concern, we have put Table S3 in the revised manuscript as Table 1, in which the information of volume fractions of alkenes and aromatics in each fuel was provided. Besides, we have deleted the sentence "The mass fraction of molecular components in all three fuels used in this study can be found in Table S4" in the manuscript but added several other sentences in this part to provide molecular lever information on fuel content.

Line 123, "The most abundant species in Fuel 1 was i-pentane, followed by toluene and 2-methylpentane (Table S3). "

Line 131, "In particular, much higher toluene, ethylbenzene and methylethylbenzene were found in F3 fuel (Table S3)."

2. "Abstract, line 30: "…while the semi volatile organic compounds (SVOCs)…"

We thank the reviewer. It has been revised.

3. Line 119: "for 1 min." Earlier in the sentence it's mentioned exhaust is continuously fed to the chamber, so this probably means, "with a residence time of 1 min."? If yes, modify the sentence.

We thank the reviewer. It has been revised as "After the engine became stable at this operating mode, the exhaust was introduced into the chamber passing through a heater (150^{o} C) and a filter, with a flowrate of 5 L/min and an injection time of 1 min."

4. Line 120: "by" a filter-based sampler

We thank the reviewer. It has been revised.

5. Line 142: what types of compounds specifically "molecular components" refer to?

Here, the "molecular components" refers to 49 molecular species in the fuel. We have deleted the sentence "The mass fraction of molecular components in all three fuels used in this study can be found in Table S4" in the manuscript but added several other sentences in this part to provide molecular lever information on fuel content.

Line 123, "The most abundant species in Fuel 1 was i-pentane, followed by toluene and 2-methylpentane (Table S3). "

Line 131, "In particular, much higher toluene, ethylbenzene and methylethylbenzene were found in F3 fuel (Table S3)."

6. Line 182-183: "Zero airflow was connected to the chamber over the entire experiment to make up for the volume of air withdrawn by the instruments. To minimize the volume withdrawn, …"

We thank the reviewer. It has been revised.

7. Line 262: consider changing ‘benefit’ to “favor”

We thank the reviewer. It has been revised.

8. Line 327: Equation is usually referred to as “Eq.”

We thank the reviewer. It has been revised.