

We are grateful to the reviewer for valuable comments. We have made our best to follow all the comments. All changes in the revised manuscript are marked in blue.

The article "Gasification of waste machine oil by the ultra-superheated mixture of steam and carbon dioxide", Reported in the article is further progress in the development of the novel Pulsed Detonation Gun (PDG) technology, by optimizing design and operating parameters to minimize the content of carbon dioxide in gasification products. The research purpose of the manuscript is clear, the structure is reasonable, and only part of the content is unclear.

Detailed comments are as follows:

1. Line 147, "The PDG is a tube with one end open and the other closed." This indicates that one end is open and the other is closed. Please mark in the figure which port can be opened, or does each port have the characteristics of opening and closing, please specify the content. In addition, it is recommended to supplement the key information in figure 1, such as spark, etc.

To follow this comment, we have replotted Figures 1a and 1b where we added showed the locations of the spark plug and the supply ports of natural gas and oxygen.

2. Line 181-182, the content indicates that it has "mendous destructive power". Will this destructive power cause damage to the flow reactor and is the degree of damage predictable? What is the pressure value that the flow reactor can withstand?

This issue was discussed in our earlier publications (see, e.g., [28]). In case of misfire, the fresh fuel-oxygen mixture can fill the gasifier and can be exploded by the subsequent detonation pulse. The flow reactor must withstand the constant-volume explosion of natural gas – oxygen mixture diluted with the products of the previous detonation pulse. So far, we used cylindrical and spherical vessels made of conventional steel with the wall thickness less than 5 mm and did not detect any deformation or damage. This is because the volume of PDGs is an order of magnitude less than the volume of gasifier. As for the feedstock, it is fragmented effectively by the shock waves.

To follow this comment, we have added the following sentence to Section 2.2:

"The issues of operation safety are discussed in detail in [28]."

3. In the experimental conditional part of 2.3, it is recommended that the author add a table to the content of lines 205-214, which may compare the experimental conditions more intuitively.

To follow this comment, we have added a new table (Table 5) and renumbered all subsequent tables.

4. Line 244, "overpressure in the flow reactor, P_r , and temperature of the wall, T_r ", please give the specific pressure and temperature measuring point location information, which should also be marked in Figure 1. In addition, whether the position of the measuring point will affect the analysis of the results should be judged.

To follow this comment, we have added to Figures 1a and 1b the locations of the pressure sensor and thermocouple. In addition, we have added two sentences in Section 2.3:

“The locations of the thermocouple and pressure sensor are shown in Figures 1a and 1b. The changes of these locations on the surface of the flow reactor did not affect essentially the measured temperature and pressure.”