

## **ABSTRACT**

Indonesia is in 9th place as the country with the worst air quality in 2020. One reason is due to air pollution caused by motor vehicle exhaust emissions. Exhaust emissions produced by motorized vehicles have a negative impact on the environment. Therefore, one of the efforts to minimize this is by developing alternative renewable energy to reduce exhaust emissions produced by motorized vehicles. One of the studies on renewable energy that is currently being developed is by utilizing a hydrogen reactor. A hydrogen reactor is a tool that can help optimize the results of motor vehicle exhaust emissions to be cleaner because the hydrogen produced from the reactor can help the combustion process in the vehicle engine.

In this study, tests will be carried out on the use of additives that can affect the results of exhaust emissions produced by combustion engines. The fuel used is Pertamina and Pertamina Turbo. The use of these two fuels aims to compare the exhaust emissions produced. The rotational speed of the combustion engine will be determined according to the results to be obtained. The additives used are octaniol and biosaver which will be included in the fuel in the combustion engine. This aims to increase the octane rating of the fuel used so that the combustion results produced by the fuel become cleaner because the required fuel is also less. The results showed that the use of additives was able to increase the octane value so that the resulting gas emission results experienced a significant change. Oktaniol can reduce carbon monoxide gas emissions by up to 84% and increase carbon dioxide gas emissions by up to 52%. Biosaver is able to reduce carbon monoxide emissions by up to 85% and increase carbon dioxide emissions by up to 52%.

Keywords: Emissions, hydrogen reactor, octaniol.