The Effect of a Heat Insulator for a Temperature Uniformity in a Waste Biomass Slow Pyrolysis

Syamsuddin Yani[1,a,*], Setyawati Yani[2,a], Brian Yozha Ramadhan[3,a]

[a]Depratment of Chemical Engineering, Faculty of Industrial Technology,

Universitas Muslim Indonesia

[*]syamsuddin.yani@umi.ac.id

Abstract. Along with the depletion of fossil-based fuel reserves, alternative fuel sources are needed, especially renewable fuels. Biomass and biomass waste are fuel that are abundantly available in Indonesia, however they require a process to improve their quality. One method commonly used to improve the fuel quality of biomass and biomass waste is pyrolysis method, especially slow pyrolysis method. Pyrolysis is performed in a reactor with certain temperature operating conditions which is expected to have an even level of temperature uniformity in the reactor. One thing that can be used to maintain uniform temperature of the materials in the reactor is by using a heat insulator. The aim of this study was to observe the temperature distribution in a fixed-bed pyrolysis reactor made of stainless steel which is used to pyrolyse waste biomass. This study is intended to demonstrate the characteristics of the heat transfer system and temperature distribution in a pyrolysis reactor equipped with a heat insulator. The study showed that the heat insulator could help to keep the uniformity of the temperature for a pyrolysis process of a waste biomass. This is an important part as a reference in designing a reactor that works more efficiently.

Keywords: **biomass waste pyrolysys, heat insulator, temperature uniformity, renewable energy**