SITTISAK UPARIVONG : STUDY ON THE FACTORS AFFECTING REACTION AND PRODUCTS OF AN UPDRAFT PYROLYSIS FURNACE. THESIS ADVISOR : ASST. PROF. SUTHIRAK SUJARITTANONTA, Ph.D. 150 PP. ISBN 974-581-099-1

A lab-scale updraft biomass pyrolysis furnace was utilized for determination of chemical reactions in the furnace including destruction of biomass by pyrolytic reaction produces gas, oil and charcoal, reduction reaction producing fuel gas and hydrolysis reaction increasing the efficiency of fuel gas production. The results of the experiment indicated that using rice husk as raw material, the gas production was 19.9 percent by volume having calorific value of 1,340 cal/g. About 18.3 percent of liquid tar was produced and about 3.15% of oil tar having 5,540 cal/g can extracted. About 61.8% of charcoal having calorific value of 4,620 cal/g was also produced.

In case of using bark pellet as raw material, production of gas having calorific value of 1,908 cal/g was 30.1 percent. About 10.8 percent of oil tar having calorific value of 6,870 cal/g was extracted. About 33.9 percent of bark pellet charcoal having calorific value of 5,540 cal/g was produced. At temperature of 700°C and 90 minute retention time, it was found that about 7-8 percent by weight of bark pellet charcoal was used in reduction reaction and about 4-5 percent by weight was used in hydrolysis reaction. By feeding steam into furnace at 10 ml/min causing hydrolysis reaction increased fuel gas production by 31.35 percent and increased gas calorific value about 18.23 percent.