

March 29-30, 2018
Edinburgh, Scotland

Arch Chem Res 2018, Volume 2
DOI: 10.21767/2572-4657-C1-003

INFLUENCE OF THE TEMPERATURE IN THE PYROLYSIS OF WHEAT STRAW PELLETS IN THE AUGER REACTOR

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Pyrolysis is attractive due to the flexibility in feedstocks possible. As part of the GreenCarbon project, there are two feedstocks for the project, and the influence of the key parameters is being studied. One of the feedstocks selected is wheat straw from Belgium. In the proximate analysis, the moisture was 7.59wt%; ash content, volatile matter and fixed carbon were measured on a dry basis and the values were 4.57wt%, 80.93wt% and 14.40wt%, respectively. The results obtained from the ultimate analysis show that the Higher Heating Value is 17.22 MJ/Kg, with 0.63 wt% of Nitrogen, 44.65wt% of Carbon and 6.88 wt% of Hydrogen. In order to establish relationships between the conditions, the feedstocks and the products, the starting point is to study the influence of temperature on the product distribution.

The system used for this study is an auger reactor system where the reactor includes a screw and is heated externally. The biomass

is fed after a valve that prevents the oxygen from entering into the system. After the reactor, the char is collected, the vapours are cooled down to recover and collect the condensable liquids and the non-condensable gases go through a cotton filter and are measured and analysed.

The conditions of the pyrolysis experiments were kept constant, except for the temperature – varied between 300-600 °C. The mass balance closure of the experiments is higher than 93%. For the experiments conducted at 300°C, torrefaction was expected. However, some pellets at 400°C were torrefied within the system. The yield of liquid has to be studied but the early results obtained are supported by literature for similar feedstocks where the peak for oil-production in the same system was found at 500°C.

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