*energies*

MDPI

*Supplementary Information*

# Biorefining of Pigeon Pea Wood: Residue Conversion by Pyrolysis

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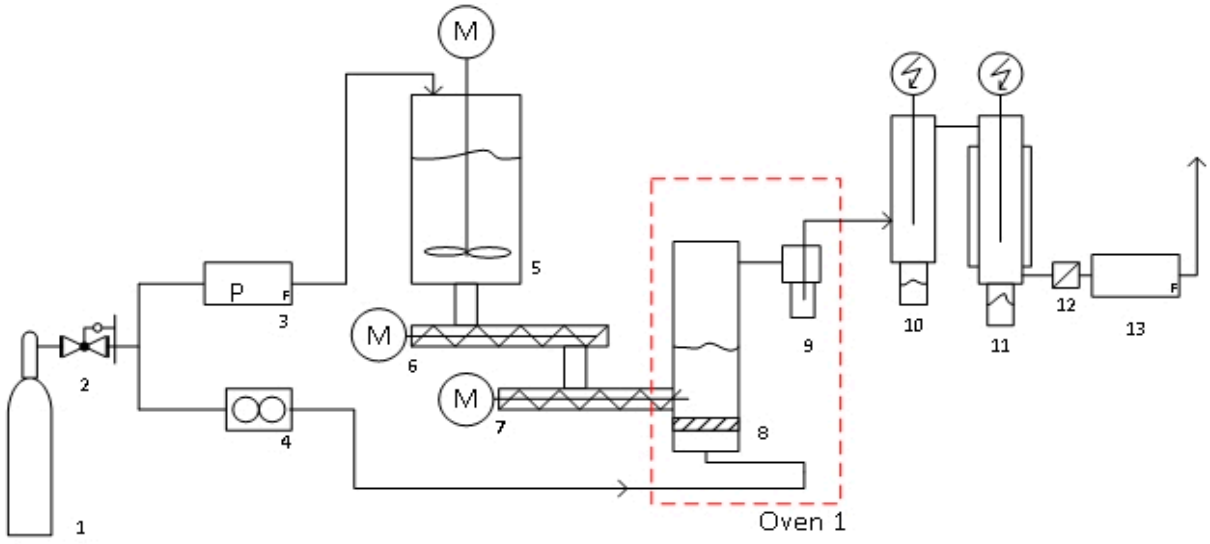


**Figure S1.** Schematic diagram of the fluidized bed reactor set-up used for the pyrolysis of pigeon pea wood at a feed rate of 100 g $h^{-1}$, temperature of 475 °C, and $N_2$ flow rate of 1.5 L $min^{-1}$.

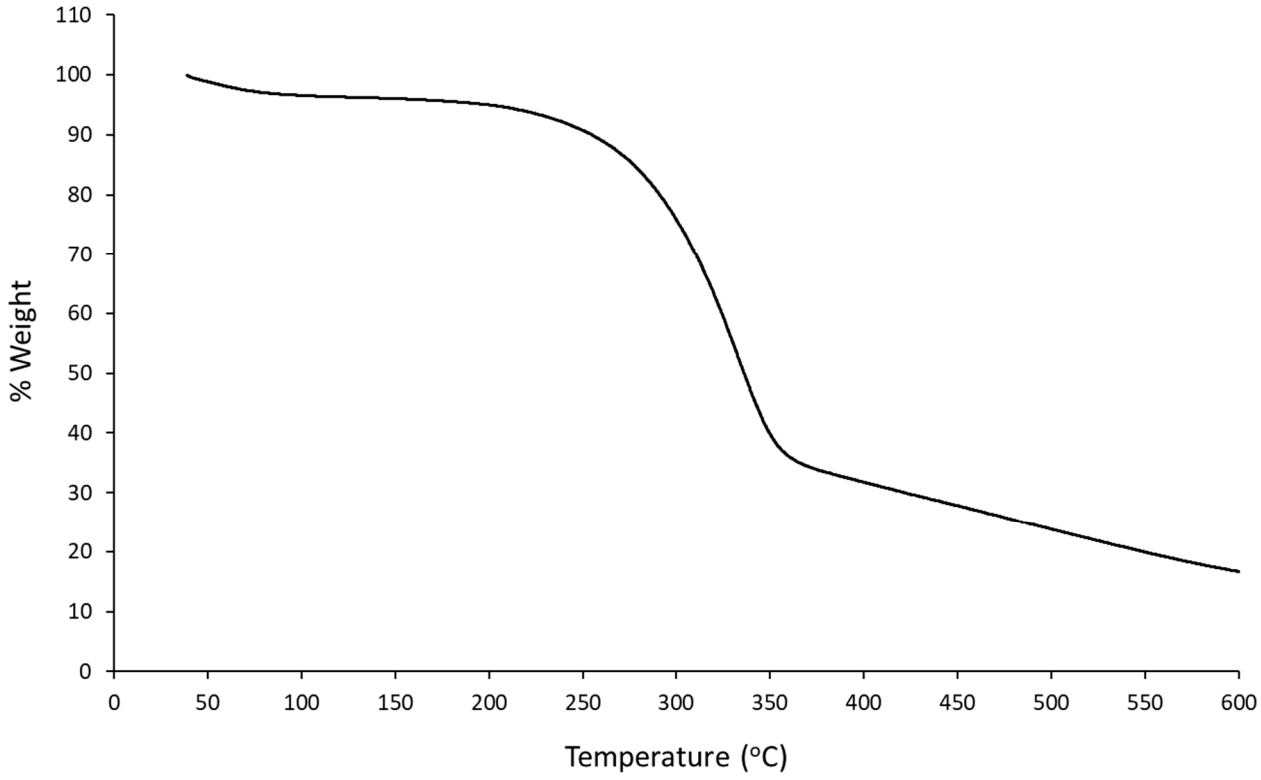


**Figure S2.** TGA profile of the pigeon pea wood sample used for pyrolysis ($N_2$ atmosphere).

**Table S1.** Solid, liquid (bio-oil), and gas yields from pigeon pea wood pyrolysis performed at various conditions in a semi-continuous reactor set-up.

| Pyrolysis run | Factor variables | | | Response variables | | | |
|---|---|---|---|---|---|---|---|
| | Tempe-rature (°C) ($X_1$) | Particle Size (mm) ($X_2$) | $N_2$ Flowrate (mL/min) ($X_3$) | Char Yield (wt.%) ($Y_1$) | Bio-oil Yield (wt.%) ($Y_2$) | Gas Yield (wt.%) ($Y_3$) | Mass Balance closure (wt.%) |
| 1 | 600 | 1.3 | 11 | 20 | 51 | 23 | 94 |
| 2 | 600 | 0.5 | 11 | 21 | 41 | 24 | 86 |
| 3 | 400 | 1.3 | 11 | 29 | 50 | 15 | 94 |
| 4 | 400 | 0.5 | 11 | 30 | 44 | 14 | 88 |
| 5 | 600 | 0.9 | 15 | 21 | 48 | 28 | 97 |
| 6 | 600 | 0.9 | 7 | 21 | 36 | 19 | 76 |
| 7 | 400 | 0.9 | 15 | 32 | 54 | 14 | 100 |
| 8 | 400 | 0.9 | 7 | 32 | 48 | 13 | 93 |
| 9 | 500 | 1.3 | 15 | 25 | 54 | 17 | 96 |
| 10 | 500 | 1.3 | 7 | 26 | 47 | 17 | 90 |
| 11 | 500 | 0.5 | 15 | 25 | 48 | 21 | 94 |
| 12 | 500 | 0.5 | 7 | 27 | 48 | 15 | 90 |
| 13 | 500 | 0.9 | 11 | 23 | 47 | 18 | 88 |
| 14 | 500 | 0.9 | 11 | 24 | 46 | 16 | 86 |
| 15 | 500 | 0.9 | 11 | 23 | 45 | 17 | 85 |