



Laboratory Scale Pyrolysis Apparatus

“The Wee Beastie”

This laboratory scale apparatus represents Stage I in the UKBRC equipment strategy. It can make small batches of biochar under carefully controlled and recorded conditions.



Objectives for Stage I Pyrolysis Apparatus

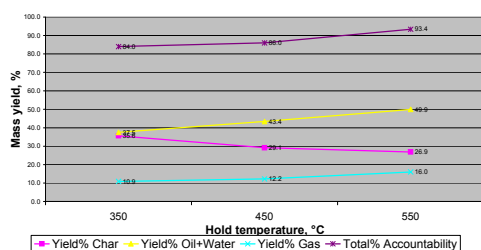
- Understand effects of changing pyrolysis conditions and feedstock on biochar properties
- Control pyrolysis conditions reproducibly
- Quantify and sample all products
- Main variables
 - Biomass type
 - Peak temperature
 - Heating rate
 - Hold time
 - Vapour residence time (gas flow rate)

Outline Capabilities

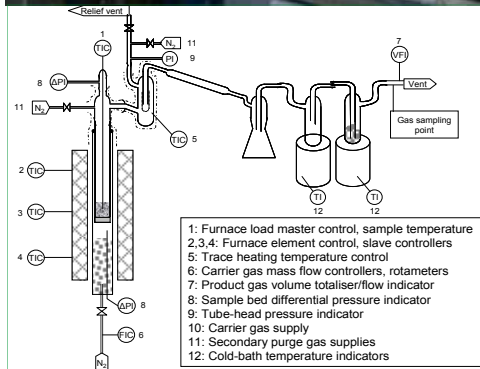
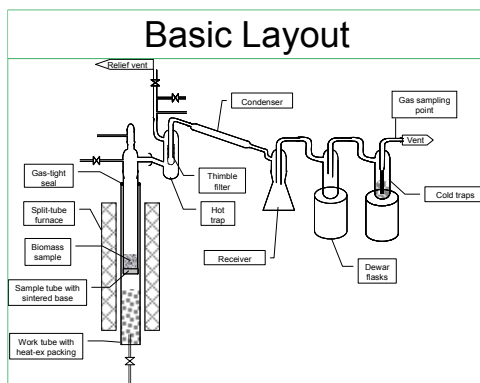
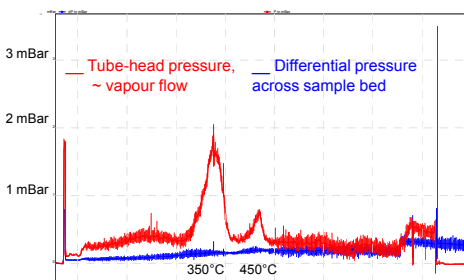
- Operation in either fixed bed or fluid bed mode
- Heated by 900mm electric split-tube furnace
 - programmed control based on sample temperature
- Pyrolysis tube borosilicate glass
 - allows temperature up to 550°C
 - higher with a quartz tube
- Heating rate variable over wide range
- Inert gas nitrogen; flow 0.3 to 25 l/min
 - will allow use for fluidised-bed fast pyrolysis in future
- Tube 50mm, sample bed up to 300mm
 - allows sample size max c.300g +/- 60% (depending on bulk density)
- Data logging for temperature, pressure and gas flow

Results of First Runs

Pyrolysis of Wood Pellets



Pressure trace, 450°C run

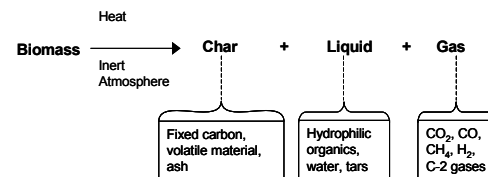


Control and Instrumentation

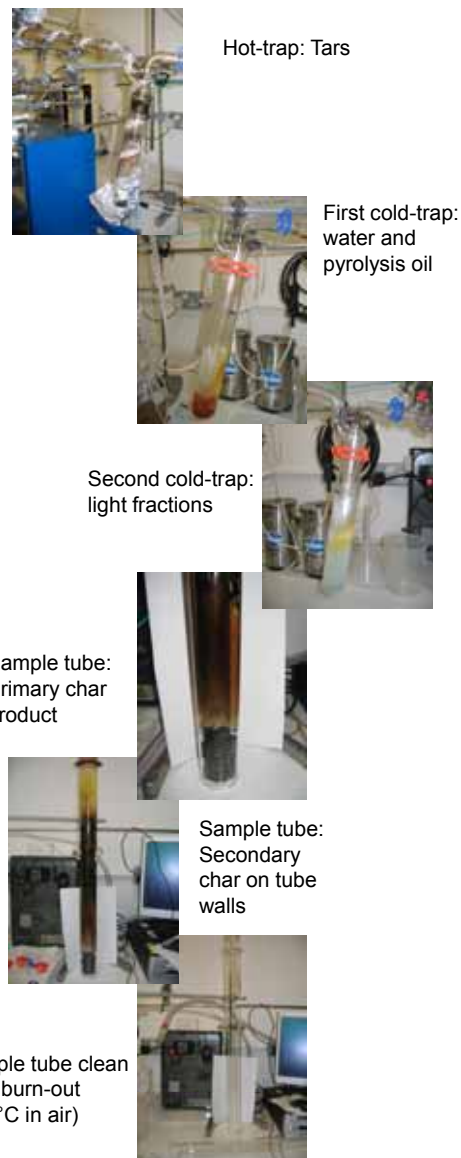
Thanks for your interest,
Pete



Pyrolysis Process



Products from 450°C run



Peter Brownsort, peter.brownsort@ed.ac.uk, +44(0)131 651 7165

