

## CARBON SEQUESTRATION USING BIO-REFINERY RESIDUES

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Biomass consists of four main constituents, cellulose, hemicellulose, lignin and minerals. The first two, are the key targets for various conversion processes producing biofuels and chemicals, leaving behind different forms of lignin, depending on extraction process used.

Numerous processes have been proposed for utilisation of the resulting lignins. Among these pyrolysis offers a number of potential applications, including production of chemicals and solid carbon products, such as biochar and activated carbons. This presentation will focus on biochar derived from lignin and other bio-refinery residues and specifically on the stability of carbon in these chars, and their potential application in carbon sequestration.

A range of 40 chars was prepared from eight selected bio-refinery residues, under five different pyrolysis temperatures (from 350-700C). The resulting chars were then tested for their stability using thermal methods, such as proximate analysis and oxidation, yielding information on their carbon sequestration potential.

The results showed that the nature of biochar, and its carbon sequestration potential were strongly affected by the type of bio-refinery residues, and therefore the original bio-refinery feedstock and the extraction method used. Despite this, many of the biochar showed a high potential for carbon sequestration.

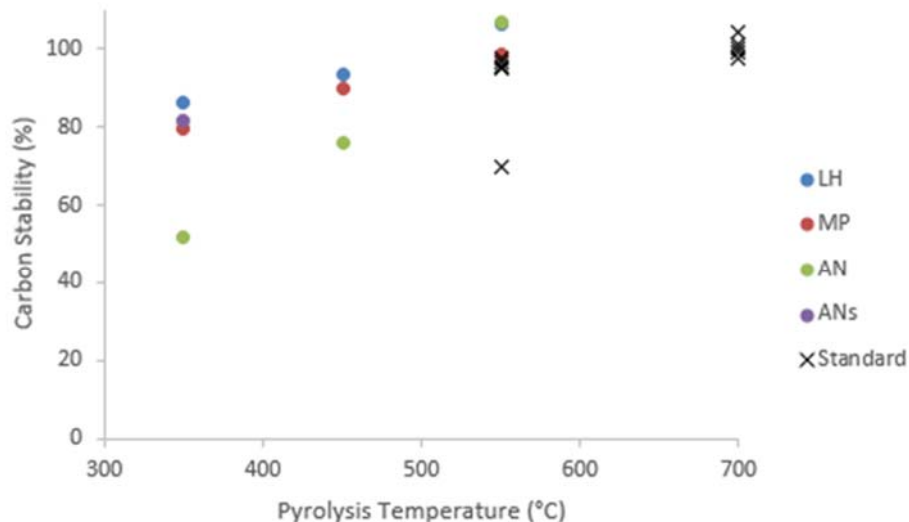


Figure 1 – Carbon stability of the bio-refinery residue biochar, compared to that of UKBRC standard biochar.