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Characterization and implications of Soot generated from Pinewood gasification

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Abstract content ** ** (Max 300 words) **
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Pinewood gasification refers to a thermochemical process whereby Pinewood is broken down to syngas and some byproducts in the presence of a limited supply of gasifying agent which may be oxygen, steam, hydrogen or even air. Syngas is a composition of carbon monoxide (CO), hydrogen (H₂), nitrogen (N₂), carbon dioxide (CO₂), methane (CH₄) and some hydrocarbons. The syngas is normally used for power generation, space heating and production of some chemicals. As the syngas is produced, simultaneously the byproducts are produced and one of the byproducts produced is the soot, a carbonaceous material resulting from an incomplete combustion of wood. The generated soot was characterized using different analytical techniques such as Fourier Transform Infrared (FTIR), Scanning Electron Microscope (SEM), Oxygen Bomb Calorimeter as well as the Elemental Analyzer. Preliminary results of the study have shown the caloric values of 25.54, 24.80, 25.20MJ/Kg with a calculated mean value of 25.18MJ/Kg. The FTIR spectrum revealed that the sample is composed of C=C, O-H, C-H, C-O, C-C functional groups. The elemental analyzer revealed an elemental composition of 78.9% Carbon, 2.0% Hydrogen, 0.8% Nitrogen, 1.1% Sulfur and 17.3% Oxygen. The final paper will present the rest of the obtained results.

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