**Cu-Mn and Cu-Ce supported over agro-based carbons: characteristics and NOx adsorption study**

ABSTRAK

As there is an urgent need for cheaper and sustainable resources for selective catalytic reduction catalyst, this study determined the potential, in terms of the catalyst characteristics and NOx adsorption, of coconut shell (CSAC) and palm kernel shell activated carbons (PSAC) to be used as precursors for the catalyst in a low-temperature flue gas denitrification system. The carbons were impregnated with bimetallic catalysts –copper-manganese (Cu-Mn) and copper-cerium (Cu-Ce) – before calcined at low temperature. The produced coconut shell catalysts (CuMn/CS and CuCe/CS) and palm kernel shell catalysts (CuMn/PS and CuCe/PS) were then characterized using a nitrogen adsorption-desorption test, Fourier-Transform infra-red, x-ray fluorescence, x-ray diffraction and hydrogen temperature-programmed reduction. The removal of NOx was also studied for all catalysts in a fixed-bed reactor. It was found that CuMn/CS gave the highest NOx removal. CuMn/CS had high pore volume, good Cu-Mn crystallinity, highmetal loading and dispersion, high copper reduction activity at the operating temperature, and rich in ketone and amine surface functional groups. It is then concluded that the coconut shell has the potential to be developed as a good SCR catalyst via impregnation with Cu-Mn.

**Keyword:** Selective catalytic reduction; NOx adsorption; Characterization; Coconut shell carbon; Palm kernel shell carbon