The Effects of Carbonization Temperature on Adsorptive Properties of Nanoporous Carbon Prepared from betel nut (Areca Catechu)

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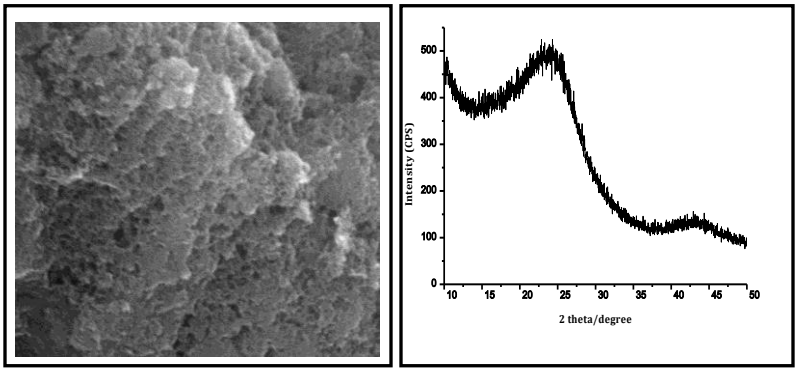
A series of nanoporous carbons were prepared from betel nut (Areca Catechu) by chemical activation with phosphoric acid at different carbonization temperature (300-700^{o}C). The prepared carbons were characterized by Fourier transform-infrared (FTIR) spectroscopy, X-ray diffraction (XRD), and scanning electron microscopy (SEM). The adsorption capacity of activated carbon was determined by iodine and methylene blue adsorption. SEM micrographs revealed that, the activated carbons were found to be mainly nanoporous (microporous and meso-porous). The X-ray diffraction indicated that, the all the carbons are amorphous in nature. FT-IR spectra have shown the presence of various oxygen containing functional groups on the surface of activated carbons. The iodine methylene blue adsorption study revealed that the micro and meso-porosity are increased progressively with carbonization temperature from 300°C to 500°C, and then decreased when the temperature exceeded 500 °C. From the experimental results, it can be concluded that, adsorptive properties of phosphoric acid activated betal nut carbon is highly influenced by carbonization temperature.



SEM micrograph and XRD spectra of Betel nut activated carbon

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