Nanocarbon materials synthesized by solution plasma process for their catalytic activity

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Nanocarbon materials were successfully synthesized from various organic solvents by Solution Plasma Process (SPP) at room temperature and atmospheric pressure. SPP was generated between two tungsten electrodes using a bipolar pulsed power supply at high frequencies 50, 100 and 150 kHz and 0.5 μs pulse width for 30 min. The plasma conditions influence the properties and structure of the synthesized nanocarbon materials. The synthesis rates were 48.8 (benzene), 14.5 (aniline), and 13 (nitro-benzene) $mg.min^{-1}$ at 150 kHz frequency. The amount of nanocarbon increased when the plasma energy increased. The nanocarbon materials were characterized by X-ray powder diffraction (XRD), X-ray photoelectron spectroscopy (XPS), Raman spectroscopy, transmission electron microscopy (TEM). The properties of nanocarbon materials were evaluated by electrical conductivity, catalytic activity.

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