

Production of carbon nanostructures by pyrolysis of nut shell

Eileen Carrillo Pedraza

Universidad Autónoma de Nuevo León, Mexico

Biomass chemical composition is mainly carbon, which is considered a primary source for the manufacture of functional carbon materials. The high carbon composition of biomass attracted scientists' attention as a standpoint to solve economic and environmental issues. The aim of this work is to obtain carbon nanostructures using a pyrolysis process followed by a chemical vapor deposition (CVD) (called from here pyrolysis vapor deposition). Pyrolytic carbon from nutshell was obtained at 450°C with a 0.75 h of residence time. Deposit nanoparticle morphologies were obtained with respect to the location in the downstream part of the reactor. At L1 position, carbon deposit groups in layers with a composition of 98.3% carbon and 1.7% oxygen. Carbon deposit at position L2 presented a semispherical conformation with a carbon composition between 98.3-100% by weight. Carbon deposit at position L3, shows a formation of carbon and iron nanobelts, as well as semispherical sintered nanoparticles, which corresponds to carbon and inorganics detected during tests. All These results support the statement that it is possible to achieve several carbon nanoparticles deposition morphologies from biomass pyrocarbon. Synthesis of carbon nanostructures from biomass by pyrolysis vapor deposition is possible but is still in early stages of development. A throughout study of pyrolysis conditions, biomass source, kinetics, morphologies and chemistry must be done in order to refine the synthesis and be able to have high quality and quantity of carbon nanostructures.

eileen.carrilopd@uanl.edu.mx