EFFECT OF TRANSITION METALS IN ONE-POT MULTI-WALLED CARBON NANOTUBES SYNTHESIS BY SPRAY PYROLYSIS

Samantha Suszek¹, Ignacio Alfredo Rivero Espejel¹

¹Instituto Tecnológico de Tijuana, Centro de Graduados e Investigación en Química, Mexico.

Carbon nanotubes are nanostructure carbon allotropes, presenting a strength on carbon-carbon bonds that gives a combination of mechanical, thermal, optical and electronic properties features with possible applications in the fields of renewable energy, water treatment and sensor technology.

The carbon nanotubes synthesis by spray pyrolysis used a metallocene as catalyst precursor, a hydrocarbon solution as carbon source injected on a heated quartz tube as substrate. The catalyst precursor forms metals agglomerations on the substrate trapping the carbon source and coating the metals clusters with carbon on the walls of the quartz tube and the surface of the metallic dopant. The carbon is integrated at the end through the cluster and the metallic dopant growing the carbon nanotube in radial and axial directions forming the multi-walled carbon nanotubes.

In this work we report a systematic study of the preparation of multi-walled carbon nanotubes by spray pyrolysis of toluene as carbon source, ferrocene as catalyst precursor in the presence of a metallic dopant evaluating the effect of transition metals on the morphology, dimension and alignment of the multi-walled carbon nanotubes by field emission scanning electron microscopy.

References:


Keywords: carbon nanotubes, metallic nanoparticles, metallic dopant

Presenting author’s email: samantha.suszek@tectijuana.edu.mx