SYNTHESIS AND CHARACTERIZATION OF POLYSTYRENE THREE-ARM-POLYDIMETHYLSILOXANE USING POLY(STYRENE – CO –VYNILTRIETHOXYSILANE) AS PRECURSOR

Natalia A. Agudelo[1] and Leon D. Perez[2]*

1 Grupo Ciencia de los Materiales, Universidad de Antioquia, Medellín Colombia.
2 Departamento de Química. Pontificia Universidad Javeriana. Bogotá D.C. Colombia. e-mail: *leon.perez@javeriana.edu.co

ABSTRACT

Herein, we report the synthesis of polystyrene three-arm Polydimethylsiloxane ($PS(PDMS)_3$) using poly(styrene – co –vyniltriethoxysilane) copolymers as precursors. $PS(PDMS)_3$ was obtained in a two-step process; first, two random copolymers of poly(St – co – VTES) having different molecular weight were prepared via free radical polymerization. The materials thus obtained, were treated with an excess of dymethyldimethoxysilane (DMDMS) to produce $PS(PDMS)_3$ by co-condensation of the alkoxysilane groups. The formation of the copolymers was confirmed by proton nuclear magnetic resonance, infrared spectroscopy, and gel permeation chromatography. Surface properties of the copolymers were studied by Atomic force microscopy, scanning electron microscopy and water contact angle measurements. $PS(PDMS)_3$ copolymers exhibited a hydrophobic behavior, showing water contact angles close to values early reported for block copolymers composed by PS and PDMS segments, and comparable with the corresponding value of PDMS.

Acknowledgement: The authors thank to “Banco de la Republica” for financial support through the grant number 2560.