



Superficies y vacío

ISSN: 1665-3521

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Sociedad Mexicana de Ciencia y Tecnología de
Superficies y Materiales A.C.

México

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Synthesis and characterization of diethyl-p-vinylbenzyl phosphonate monomer: precursor of
ion exchange polymers for fuel cells

Superficies y vacío, vol. 22, núm. 3, septiembre, 2009, pp. 6-10
Sociedad Mexicana de Ciencia y Tecnología de Superficies y Materiales A.C.
Distrito Federal, México

Available in: <http://www.redalyc.org/articulo.oa?id=94216153002>

Abstract

Synthesis of diethyl-p-vinylbenzyl phosphonate (DEpVBP) monomer and its homopolymer, precursors of ion exchange materials, are reported. DEpVBP monomer was synthesized by means of Michaelis-Arbusov reaction of p-vinylbenzyl chloride with triethyl phosphite in the presence of cupric chloride using chlorobenzene as solvent with a yield of 75%. Homopolymer was synthesized by free radical polymerization reaction using AIBN as a free radical initiator at 70 °C in DMF. The structures of the compounds were determined from NMR, FT-IR and Raman spectroscopy. Good thermal stability of homopolymer (up to 200 °C) indicates that these compounds are excellent candidates to be used in the development of new proton exchange membranes for fuel cells.

Keywords

Ion exchange polymers, Phosphonated polymers, Metallorganic compounds.

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