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Optical phonon spectra of CdS crosslinked sulfonate polystyrene nanocomposites JAYESH GOVANI, FELICIA MANCIU, Department of Physics, University of Texas at El Paso, S. ORTIZ-COLÓN, MATTHEW ESPE, Department of Chemistry, University of Akron, RONALD ZIOLO, Centro de Investigación en Química Aplicada, UNIVERSITY OF TEXAS AT EL PASO TEAM, UNIVERSITY OF AKRON TEAM, CENTRO DE INVESTIGACIÓN EN QUÍMICA APLICADA TEAM — We have used IR transmission and FT-Raman spectroscopy to study optically active phonon modes of CdS nanoparticles synthesized in sulfonated polystyrene resin and obtained information about the morphology, crystallinity, and surface interactions. The dominant feature in the far-infrared region of CdS/polystyrene nanocomposites spectra is a sharp peak centered at 255 cm^{-1} , which could be assigned to the transversal optical mode at the L edge of the Brillouin zone of CdS nanoparticles. Also, this vibrational line, based on theoretical core-shell model calculation, could be attributed to the presence of a very thin CdS shell layer. HRTEM images of the CdS nanocomposites show CdS nanoparticles of about 2.5 nm aligned in rows or strings on the polymer surface. Amorphous CdS is also present and may be seen surrounding the nanocrystalline regions. Complementary solid state ^{113}Cd NMR analysis will be presented as well.

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