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Nanocomposites foams of polypropilene modified by ionizing radiation containing CaCo3/ag° nanoparticles of bio-calcium carbonate-study of bactericidal effect

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This paper presents a study of high melting strength polypropylene (HMSPP) foams by gamma irradiation with insertion of silver nanoparticles (AgNPs) adsorbed in carrier of CaCO₃ (natural source) aiming bactericidal effect. The use of silver (Ag^o) gives important antibacterial property since silver is highly toxic against bacteriae. The HMSPP matrix was processed in a twin screw extruder under CO₂ atmosphere and polypropylene nanocomposites (HMSPP-AgNC) were obtained in different concentrations of silver. The material was characterized by scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS), field emission scanning electron microscopy (FESEM), X-ray diffraction spectroscopy (XRD), cytotoxicity assay and reduction colony-forming-unit (CFU). The analyzed foams showed spherical clusters and homogeneous regions with good distribution of the silver nanoparticles. Furthermore, the HMSPP@AgNCs foams exhibited a antibacterial efficiency against *E. coli* and *S. aureus* due to the presence of the biocidal silver nanoparticles.

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Biography

Graduated in Chemistry by São Paulo University (1979), Professor of Environmental Chemical Center (CQMA), in IPEN/SP (Nuclear Research Institute) since 2001, specifically in Polymers Laboratory – Master in Organic Chemistry- Natural Products in 1985, Doctor in 1995 with thesis on Stabilization and degradation of rubbers, pos-doctorate in Luminescent Polymers. Actually, researcher and advisor of PhD program, in nuclear modification of polymer for compatibilization, membranes for drug delivery, nanocomposites for health care products and bactericidal foams.

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