



Contribution ID: 51

Type: Oral

Synthesis of Amine-Containing Surfaces in Poly(Tetrafluoroethylene) by Gamma Radiation

Monday, 24 April 2017 17:10 (20 minutes)

Burillo Guillermina(1), Adán Hezael(1), Angélica Cruz(1), Juan Carlos Ruiz(2).

1)Instituto de Ciencias Nucleares, Universidad Nacional Autónoma de México; 2)Universidad Autónoma Metropolitana, Iztapalapa, México.

Amine grafting polymers can be useful surfaces for cell colonization, they are usually prepared by plasma polymerization of alkylamine monomers. Gamma radiation could be a good method to graft several monomers with amine groups in the desired polymer substrate as PE, PP, PET, etc. In this study, amine surface in poly(tetrafluoroethylene) (PTFE) was obtained by two different methods: a) grafting of acryloylchloride by radiation direct method and preirradiation peroxidation method of acryloylchloride in dichloroethane solution and further reaction with diethyldiamine. b) preirradiation peroxidation grafting of acrylic acid (AAc) onto PTFE, acylation reaction with SOCl_2 and further reaction with diethyldiamine. The grafting of AAc onto PTFE was studied before by Sadurni et al (2000). The grafting of acriloyl chloride onto PTFE was synthesized for the first time; the radiation direct method was the best method with higher grafting yield. The effects of the monomer concentration, absorbed dose, and reaction time were studied. The amount of amine groups were evaluated, gravimetrically and the density of amine groups in the surface by derivatization with 4-trifluoromethylbenzaldehyde (TFBA) followed by (X-ray Photoelectron Spectroscopy (XPS) analysis. Samples were also characterized by FTIR, contact angle, SEM and AFM. Further studies will report the presence of a critical concentration of amine groups to adhere different types of cell lines.

Acknowledgements.

We thank A. Ortega, Martin Cruz, Luz Maria Escamilla y Luis Miguel Valdez from ICN UNAM for the technical assistance and DGAPA UNAM grant 200116 for financial support.

Country/Organization invited to participate

Mexico

Primary author: Ms BURILLO, Guillermina (Instituto de Ciencias Nucleares UNAM, Mexico)

Co-authors: Mr HEZAEL, Adan (Instituto de Ciencias Nucleares UNAM, Mexico); Ms CRUZ, Angelica (Instituto de ciencias nucleares UNAM, Mexico); Mr RUIZ, Juan Carlos (Universidad Autonoma Metropolitana, Mexico)

Presenter: Ms BURILLO, Guillermina (Instituto de Ciencias Nucleares UNAM, Mexico)

Session Classification: A03

Track Classification: RADIATION SYNTHESIS AND MODIFICATION OF MATERIALS