J Material Sci Eng 2013, 2:4
http://dx.doi.org/10.4172/2169-0022.S1.012

OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference and Exhibition on
Materials Science & Engineering

October 07-09, 2013 Hampton Inn Tropicana, Las Vegas, NV, USA

Modifications of the thermal and molecular properties of a PADC polymer film induced by γ-rays

Noura Saad[1], A. F. Saad[1,2] and S. T. Atwa[3]
[1]University of Benghazi, Libya
[2]Zagazig University, Egypt
[3]Banha University, Egypt

Irradiation effects on the thermal stability, molecular and structural properties of a poly allyl diglycol carbonate (PADC) polymer have been investigated. PADC films were exposed to γ-rays at high doses ranging from 5.0×10^5 to 1.0×10^6 Gy. The induced modifications were analyzed using thermo-gravimetric analysis (TGA) and Fourier Transform IR spectroscopy (FTIR) in transmission mode. The thermo-gravimetric analysis (TGA) indicated that the PADC film decomposed in three main stages. The activation energy of thermal decomposition was determined using a type of Arrhenius formula based on the TGA experimental results. The FTIR spectra show a general reduction of intensity of the typical bands, indicating degradation of the backbone of the PADC polymer as a result of the γ-ray irradiation. The IR absorption bands for CO_2 were clearly observed. The absorbance rapidly increased, in proportion to the dose, up to 4×10^5 Gy, followed by a gradual decrease with increasing dose to 1×10^6 Gy. This decline in absorbance of the CO_2 bands might be explained by the diffusion of CO_2 at the higher irradiation rates during the long irradiation time. This study presents novel quantitative results showing that the exposed PADC films do not undergo continual further degradation from high energy γ-photons with increase in dose.

Biography

Noura Saad has completed her B.Sc. in Physics (Major: Medical Physics) in February 2013 from the University of Benghazi, Libya. During her B.Sc. she did a research project under supervision by Prof. Saad, which was- the effect of ultraviolet radiation on the properties of polymeric track detectors. She currently started her M.Sc. research work on radiation-induced modifications of the thermal, structural and optical properties of a PADC polymer film based NTDs. She has two papers under preparation and will be submitted to the international reputed journals.

nour.saad60@yahoo.com

Effect of a natural adsorber as nano particle hydro gel to water shut- off during enhanced oil recovery process

O. Arjmand and M. Mousavi
Islamic Azad University, Iran
[2]Zagazig University, Egypt
[3]Banha University, Egypt

Polymeric gels are a water-soluble polymer gel, network cross-link agent and solvent polymer gels in the fracture area with high permeability by formation of a solid mass are utilized in this research study. Bentonite as a nano particle was added to poly acryl amid hydro gel to increase adsorption. Bentonite as a nano particle was utilized in different concentration, in this study mechanical and physical property of nano hydro gel solution such as impact, tension, glass transition temperature, humidity absorption, and scanning electron microscopy (SEM) tests have been done and the results revealed that as the cross-linking occurs, tension in rupture region increases. As seen at scanning electron microscopy tests, adsorption of the polymer increased significantly. It is very important that this solution (nanocompsite / gel polymer solution) in very low rates of injection to be flooded into reservoirs with high pressure and low temperature because of low rate of injected solution mass transfer further and resulting adsorption of hydro gel on rock reservoir will increase and the matrix polymer gel to block of the notch reservoir with more durable and strength will form.

Biography

Noura Saad has completed her B.Sc. in Physics (Major: Medical Physics) in February 2013 from the University of Benghazi, Libya. During her B.Sc. she did a research project under supervision by Prof. Saad, which was- the effect of ultraviolet radiation on the properties of polymeric track detectors. She currently started her M.Sc. research work on radiation-induced modifications of the thermal, structural and optical properties of a PADC polymer film based NTDs. She has two papers under preparation and will be submitted to the international reputed journals.

omidarjemand@yahoo.com