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Modification of molecular and optical properties of cellulose triacetate by alpha particles irradiation

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Samples from sheets of the polymeric material cellulose triacetate have been exposed to alpha particles in the dose range 20-100 Gy. The modifications induced in its molecular and optical properties due to alpha particles irradiation have been studied through different characterization techniques such as intrinsic viscosity, refractive index and color difference studies. The results indicated that the crosslinking is achieved at the dose range 60-100 Gy. This crosslinking led to an increase in the value of intrinsic viscosity, indicating an increase in the average molecular mass. This was associated with an increase in the refractive index. Additionally, the non irradiated cellulose triacetate samples showed significant color sensitivity towards Alpha particles irradiation. This sensitivity appeared in the change in the blue color component of the non irradiated cellulose triacetate film to yellow after exposure to alpha particles up to 100 Gy. This is accompanied by a net increase in the darkness of the samples.

Biography

M M Abutalib is an Associate Professor at the College of Science for Girls, King Abdulaziz University, Saudi Arabia. He completed PhD in 2005 and the Title of his thesis was "Uses of Neutron Capture Gamma-Ray Spectroscopy Technique for Elemental Analysis of Some Local Industrial Materials". He attended and participated in many National and International conferences. He published articles in reputed journals and has received Scientific Publishing awards. He was also a life time member in Societies like Qatif Astronomy Society, The American Physical Society, Saudi Scientific Society for Physical Sciences, Arab Association of Radiological Protection.

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