

A Homogenous Material Composed of PVC and EVA Applied in Thermal Conditions and Resistant to Gamma Irradiation up to 50 KGy.

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Abstract. The interest of our work is to create a new material resistant to gamma irradiation up to 50 KGy using PVC with some additives and EVA. It ranks among new polymer material with remarkable combination of properties, such as heat resistant, low moisture uptake, mechanical and morphological properties compliant. Moreover, the structure of a polymer with a homogenous matrix enables its use as a material acceptable for particular applications such as coating of cables and insulation in nuclear centers. In this work, the PVC and EVA at 10% is to combine the useful properties to develop a product resistant to thermal aging at 80°C and gamma rays up to 50 KGy. In the first stage, physical, thermal, dielectric and morphological tests were carried out on PVC and PVC/EVA/10%. Then, the effect of aging on mechanical properties (tensile strength, elongation at break and Young modulus) and the changes induced in the thermal analysis and morphology due to gamma radiation was investigated from 10 KGy to 50 KGy. The results revealed that the gamma irradiation affected considerably the PVC properties but the mechanical, thermal and morphological properties of PVC/EVA/10% was improved, which puts a new material applied in thermal conditions and resistant to gamma irradiation up to 50 KGy.

Keywords: Ethylene vinyl acetate, gamma radiation, mechanical stress, poly (vinyl chloride).