

TEMPERATURE, ENVIRONMENT AND ADMIXTURE INFLUENCE ON POLYMER FOOD PACKAGES

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Experiments have been carried out by use of X-band EPR spectrometer and UV-Vis (300–1100 nm) spectrophotometer in the range of temperatures from room up to 368 K (95°C). Polyterephthalate ethylene (PET) films often are used as food packages. Pure PET polymers and PET with low concentration admixtures (~1%) of dyes were investigated. Average distances between dye molecules were of order of nanometers. Investigated samples were immersed in three different solutions (water, nonsaturated fat and saturated fat). Dyes were stable in used environments and range of temperatures. 1% concentration of dye modifies macroscopic properties of polymer (Grytsenko, Grynko, Schrader, Jurga & Manikowski, 2004; Przygocki & Włochowicz, 2001). PET polymers used in food industry contain measurable amount of free radicals. “Broad” EPR spectrum decreases (4–6 times) when temperature of polymer rises and changes its shape. Dye addition (1%) to the PET polymer decreases amount of free radicals several times. Presence of some dye create new radicals during heating. Dye presence in polymer stabilizes physical properties of polymer in the range of temperature used and increases the phase transition temperature. Thermal changes of PET polymer have common feature for all used environments but quantitatively differences are observed.

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