

# THE DSC STUDY ON PHYSICAL AGING OF PET

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## ABSTRACT

Isothermal enthalpy relaxation in polyethylene terephthalate (PET) was measured at different annealing temperature below the glass transition temperature ( $T_g$ ) on a differential scanning calorimeter (DSC). The endothermic peaks below  $T_g$  were found on DSC scan curves and the peaks increased in magnitude and shifted to higher temperature with increasing aging time. We found the empirical fractional exponential function could describe the aging phenomena. The time constant  $\tau_c$  in the fractional exponential function was lower at higher aging temperature. It meant the aging rate was increasing with aging temperature. The temperature dependent activation energy obtained from this method was about 40 Kcal/mole. Also from the fractional exponential function fitting, we found that the relaxation curves of samples aging at different temperatures couldn't be superimposed by a shift in time.

Keywords: physical aging; relaxation; PET ; DSC ; glass transition temperature; fractional exponential function