

Glass Transition Temperature of Polycaprolactone, Poly(L-lactide) and Polystyrene in Supercritical Fluids

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Polymeric materials are characterized by two major types of transition temperatures - the crystalline melting temperature T_m and the glass transition temperature T_g . The crystalline melting temperature is the melting temperature of the crystalline domains of a polymer sample. The glass transition temperature is the temperature at which the amorphous domains of a polymer take on the characteristic properties of the glassy state - brittleness, stiffness, and rigidity. Varieties of methods have been used to determine T_g . The most commonly used method is differential scanning calorimetry (DSC). DSC reflects the change in heat capacity of a sample as a function of temperature by measuring the heat flow required to maintain a zero temperature differential between an inert reference material and the polymer sample. Recrystallization of polycaprolactone, poly(L-lactide) and polystyrene using Aerosol Solvent Extraction System led to higher degree of homogeneity and purity.