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A Novel Technique to Measure Enthalpy Recovery for Polymer Glasses Subsequent to Temperature and Plasticizer Concentration Jumps.[1] LAMECK BANDA, Dept. of Chemical Engr., Texas Tech University, MATAZ ALCOUTLABI, Dept. of Chemical Engr., University of Utah, GREGORY MCKENNA, Dept. of Chemical Engr., Texas Tech University — We report results of the enthalpy recovery of polymer glasses subsequent to temperature jumps and carbon dioxide pressure jumps in the isothermal mode. The results were performed on a novel system that was built in our laboratory. The system is a Setaram C80 calvet calorimeter that we modified to include pressure capabilities. The system also offers the advantage of large bore chambers that facilitate the use of large samples. Additionally, experiments of enthalpy recovery subsequent to plasticizer concentration histories in the isothermal mode are feasible. Enthalpy recovery results show qualitative similarities with volumetric measurements reported in our previous work. Particularly, the three signatures of structural recovery; intrinsic isopiestics, asymmetry and the memory effect are observed. Further, consistent with the volumetric observations, enthalpy recovery results also show that equilibration times for the polymer glass are longer when the glass transition is traversed through a plasticizer jump than when traversed through a temperature jump.

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