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The Defect Diffusion Model and Isochoric Energy and Isobaric Enthalpy for Glass Formers MICHAEL SHLESINGER, Physics Department, U.S. Naval Academy, Annapolis, MD 21402-5026 and Office of Naval Research, Code 30, 875 N. Randolph St., Arlington VA 22203, JOHN BENDLER, Department of Chemistry, South Dakota School of Mines, Rapid City, SD 57701 and Physics Department, U.S. Naval Academy, Annapolis, MD 21402-5026, JOHN FONTANELLA, MARY WINTERSGILL, Physics Department, U.S. Naval Academy, Annapolis, MD 21402-5026 — The defect diffusion model produces stretched exponential relaxation, in supercooled liquids, through the sub-diffusive motion of defects. The aggregation of the defects produces a Vogel-Fulcher type law for the divergence of the time scale at a critical temperature. The model is employed to calculate the ratio of the apparent isochoric activation energy to the isobaric activation enthalpy, $E_V{}^*/H*$ or E_V/E_P,. This ratio measures the relative sensitivity of kinetic processes to changes in volume and temperature respectively. This ratio equation is tested using dielectric relaxation data for poly(vinyl acetate), viscosity data for glycerol and ionic conductivity data for poly(propylene glycol) containing $LiCF_3SO_3$. Good agreement between theory and experiment is found using model parameters previously published.

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