

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Gas Diffusion and Free Volume Behavior of Ethylene Vinyl Alcohol Copolymers: Effect of Hydrogen Bonding Interaction JUSTIN BRANDT, SERGEI NAZARENKO, BRIAN OLSON, University of Southern Mississippi, ALEXANDER JAMIESON, Case Western Reserve University — The main objective of this work was to develop fundamental understanding of oxygen transport in a broad range of EVOH copolymers as it is related to free volume characteristics and hydrogen bonding interaction. FTIR was used to directly characterize H-bonding network as a function of copolymer composition and temperature. Positron annihilation lifetime spectroscopy (PALS) was used to study free volume behavior. The measure of intermolecular interaction, cohesive energy density, was calculated through group contribution methods and also obtained using molecular dynamics computer simulations. Oxygen transport characteristics of the copolymers, i.e. permeability, diffusivity, and solubility were measured at various temperatures, and the apparent activation energy parameters calculated.

Brian Olson
University of Southern Mississippi

Date submitted: 21 Nov 2008

Electronic form version 1.4