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On the Nature of Gas Transport of Ethylene Vinyl Alcohol Copolymers SERGEI NAZARENKO, JUSTIN BRANDT, BRIAN OLSON, University of Southern Mississippi, ALEXANDER JAMIESON, Case Western Reserve University — Historically, all the approaches describing gas diffusion in polymers can be roughly divided in two categories, based on free volume models and the activation molecular models, which take into account the cooperative penetrant-polymer chain motions, chain rigidity and intermolecular forces. Although gas transport characteristics exhibit a general correlation with free volume, alone free volume can not adequately describe gas barrier. The chain rigidity and the strength of intermolecular interactions are two additional important factors which are manifested via activation energy. 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 probed by positron annihilation lifetime spectroscopy and hydrogen bonding interaction.

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