

Abstract Submitted
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Welding Immiscible Polymer with Supercritical Fluid XIAOCHU WANG, ISAAC SANCHEZ, University of Texas at Austin — Polymer adhesion between two immiscible polymers is usually poor because there is little interpenetration of one polymer into the other at the interface. Thus, increasing the width of the interfacial zone can enhance adhesion and mechanical properties. In principle, this can be accomplished by exposing the solid polymer materials to high pressure CO₂. The CO₂ acts as a common solvent and promotes interpenetration. It also increases the mobility at the interface which helps to promote the "welding" of the two polymers. A combination of the gradient theory of inhomogeneous systems and the Sanchez-Lacombe Equation of State was used to investigate this phenomenon. We calculate the interfacial density profile, interfacial thickness and interfacial tension between the two polymers with and without CO₂. We find that the interfacial tension is decreased and the interfacial thickness is increased with high pressure CO₂, which means that the presence of CO₂ does help polymer welding.

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