

## **A New Theory to Predict Interfacial Tension of Polymer Pairs in Compressible Condition of the Interface**

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Interfacial tension is a significant factor that determines the miscibility of the components, the blend morphology and its mechanical behavior. In this study, a new theory combined with a simple free energy model was employed to predict the interfacial tension of polymer melts. Indeed, a new relation for compressible condition of the interface was derived in order to predict the interfacial tension of polymer pairs melt state. The new theory predicts both value and temperature dependence of interfacial tension, although no adjustable parameter is used in calculating interfacial tension. The whole required parameters can be obtained from the literature or may be calculated theoretically. The results were compared well with the predictions of previous theories (Broseta et al. theory which is a modified version of Helfand and Tagami theory) and also with experimental data reported in the literature. The prediction ability of the temperature dependency of interfacial tension for some polymer pairs using the new theory was demonstrated through comparison with reported experimental data.