Tackiness of Polymer Melts. AIPING ZHOU, Chemical Engineering, Tongji University, Shanghai, XIAORONG WANG, Chemical Engineering, Institute for Advanced Study, Tongji University, Shanghai — Understanding tackiness is important for many industrial applications. This work studies the most basic and important tacky behavior of entangled linear polyisoprenes of various molecular weights to a stainless steel surface. The maximum tacky force ($F_{max}$) is found to be influenced by many factors, e.g., contact time, separation speed, polymer molecular weight, temperature and etc. However, there is one thing in common: when the probe separation speed ($v$) is greater than a critical speed ($v_c$), the force $F_{max}$ can be described by a power function $F_{max} \propto t_{max}^{-1/2}$, where $t_{max}$ is the time corresponding to the maximum force at constant separation. When the separation speed is less than $v_c$, the force $F_{max}$ is nearly independent of $t_{max}$ and separation speed, apparently existing a plateau regime. Further decreasing the separation speed eventually moves a material into the terminal flow regime, in this case $F_{max}$ scans like $F_{max} \propto t_{max}^{-1}$. The tackiness of entangled linear polymer melts is basically associated with the viscoelastic dissipation and characteristics of the entangled polymer chains at the contact interface.

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Date submitted: 12 Nov 2016