Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

**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..

Xiaorong Wang
Chemical Engineering, Institute for Advanced Study, Tongji University, Shanghai

Date submitted: 12 Nov 2016 Electronic form version 1.4