Materials Day 2007: Sticking and Sliding, Wearing and Tearing

Tribology and Adhesion Issues in Materials Science

«Thermodynamics of Wall Slip»

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While the evolution equations for complex fluids are usually formulated such that they respect the principles of nonequilibrium thermodynamics, the choice of appropriate boundary conditions is often considered as a purely mathematical problem. We emphasize that also the formulation of boundary conditions should be guided by thermodynamics. We sketch some ideas of the emerging "boundary thermodynamics" developed for systems consisting of coupled 3-d bulk and 2-d boundary variables. The ideas and concepts are illustrated in the context of velocity slip of melts of entangled polymers at solid walls.