Temperature Effects in Nanoscale Friction: Thermal Probes Reveal the Role of Capillary Bridges

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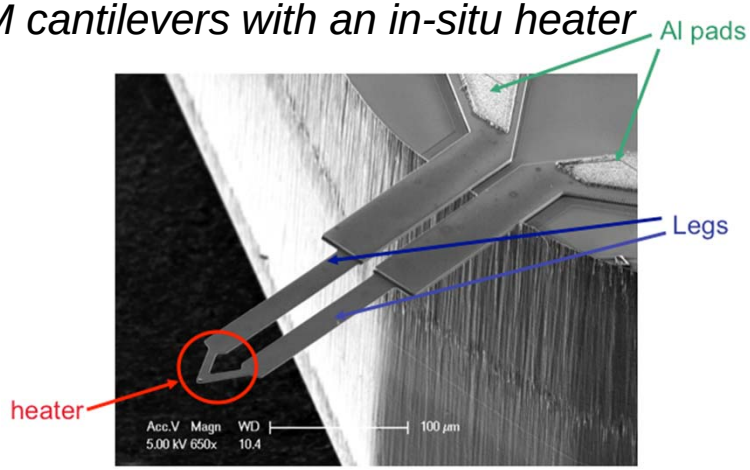
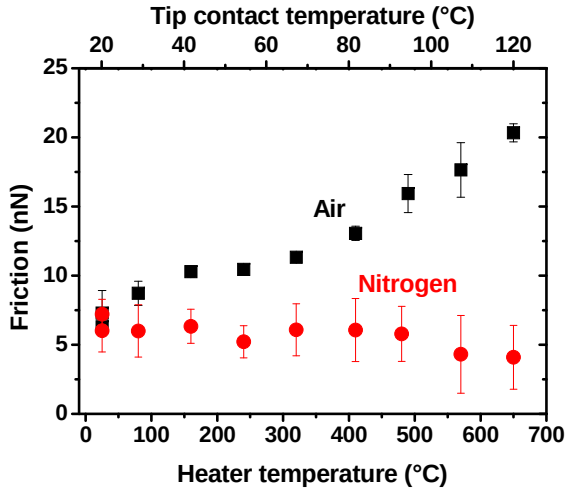
AFM cantilevers with an in-situ heater

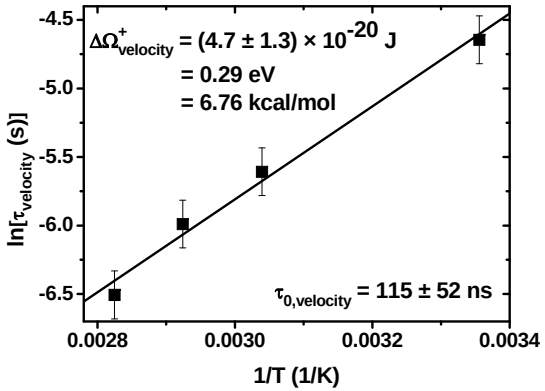


Lee *et al.*, J. MEMS **15** (2006) 1644-1655



In humid air, friction increases with temperature due to the thermal nucleation of a water meniscus

Results show excellent agreement with Arrhenius kinetics



Greiner et al., NanoLetters, 10, 4640–4645 (2010)

Capillary observed in environmental SEM