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

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AFM cantilevers with an in-situ heater

SiO₂ sample: In humid air, friction increases with temperature due to the thermal nucleation of a water meniscus, then decreases due to evaporation

Si sample: Results show excellent agreement with Arrhenius kinetics

Capillary observed in environmental SEM
