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Evaporation of water between two microspheres: how wetting affects drying.[1] KUN CHO, School of Advanced Materials Science and Engineering, Sungkyunkwan University, YESEUL KIM, SKKU Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan University, JUN LIM, Beamline Division, Pohang Light Source, JOON HEON KIM, Advanced Photonics Research Institute (APRI), Gwangju Institute of Science and Technology (GIST), BYUNG MOOK WEON[2], School of Advanced Materials Science and Engineering, SKKU Advanced Institute of Nanotechnology (SAINT), Sungkyunkwan University — When a small volume of water is confined between microparticles or nanoparticles, its evaporation behavior can be influenced by wettability of particles. This situation frequently appears in coating or printing of colloidal drops in which colloidal particles are uniformly dispersed into a liquid. To explore water evaporation between particles, here we study on evaporation dynamics of water between two microspheres by utilizing high-resolution X-ray microscopy for side views and optical microscopy for bottom views. We find that evaporating water gets pinned on microsphere surfaces, due to a force balance among air, water, and microspheres. Side and bottom views of evaporating water enable us to evaluate water curvature evolution around microspheres before and after pinning. Interestingly curvature evolution is controlled by cooperation of evaporation and wetting dynamics. This study would be useful in identifying and controlling of coating or printing for colloidal drops.

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