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Inclination effect on evaporation of colloidal droplets[1] JIN YOUNG KIM, Research Center for Advanced Materials Technology, SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University, MARTA GONCALVES, SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University, HYOUNGSOO KIM, Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology, BYUNG MOOK WEON, School of Advanced Materials Science and Engineering, SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University — When colloidal droplets including micro- and nanoparticles evaporate on flat solid substrates, commonly ring-like depositions are generated by continuous outward capillary flows. When the substrate is inclined, droplets become asymmetric and non-spherical by gravity and it affects evaporation dynamics and particle deposition. However, inclination effects on evaporation and deposition are not clear yet. Here we observe evaporation and deposition of colloidal droplets by changing particle sizes and tilting angles. We find that there is competition between downward sedimentation flows by gravity and upward capillary flows by evaporation, inducing that uniformity of coffee-rings depends on particle sizes and tilting angles. For small particles, evaporation-driven upward flows are more dominant than gravity-driven downward flows.

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