

Abstract Submitted
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Wicking-mediated drying in porous media¹ MARTA GONALVES, YESEUL KIM, SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University, JIN YOUNG KIM, Research Center for Advanced Materials Technology, Sungkyunkwan University, NAJAF RUBAB, SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University, TAKESHI ASAI, SUNGCHAN HONG, Institute of Health and Sports Science, University of Tsukuba, BYUNG MOOK WEON, School of Advanced Materials Science and Engineering, SKKU Advanced Institute of Nanotechnology, Sungkyunkwan University — When a water droplet is placed on a porous substrate, wicking and drying come up simultaneously. Wicking is a spontaneous liquid flow through porous media by capillarity and drying is a spontaneous vapor flow by vapor diffusion. Despite simultaneity of wicking and drying in porous media, how wicking affects drying is not clear yet. Here we study how wicking dynamics evolves with time and cooperates with drying dynamics by microscopic observations of water droplets on porous materials such as fabrics and papers. We find that wicking at early stages expands the surface area of absorbed water through porous materials, accelerating the evaporation rates. X-ray microscopy is a powerful tool to observe pore networks and water flows inside wicking fabrics. This result is useful to comprehend cooperation and to improve optimization between wicking and drying in porous media.

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