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Assembly of silver nanowire ring induced by liquid droplet¹ BAEKHOON SEONG, korea institute of ocean science and technology (KIOST), HYUN SUNG PARK, University of California, Berkeley, ILKYEONG CHAE, HYUNGDONG LEE, XIAOFENG WANG, Sungkyunkwan University, HYUNG-SEOK JANG, University of California, Berkeley, JAEHYUCK JUNG, CHANGGU LEE, Sungkyunkwan University, LIWEI LIN, University of California, Berkeley, DOYOUNG BYUN, Sungkyunkwan University — Several forces in the liquid droplet drive the nanomaterials to naturally form an assembled structure. During evaporation of a liquid droplet, nanomaterials can move to the rim of the droplet by convective flow and capillary flow, due to the difference in temperature between the top and contact line of the droplet. Here, we demonstrate a new, simple and scalable technology for the fabrication of ring-shaped Ag NWs by a spraying method. We experimentally identify the compressive force of the droplet driven by surface tension as the key mechanism for the self-assembly of ring structures. We investigated the progress of ring shape formation of Ag NWs according to the droplet size with theoretically calculated optimal conditions. As such, this self-assembly technique of making ring-shaped structures from Ag NWs could be applied to other nanomaterials.

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Baekhoon Seong korea institute of ocean science and technology (KIOST)

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