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**Precipitation of salt in saline water drop on superhydrophobic surface** BONGSU SHIN, Seoul National University, MYOUNG-WOON MOON, Korea Institute of Science and Technology, HO-YOUNG KIM, Seoul National University — In the membrane distillation process, water vapor of heated, pressurized saline water is transported across the membrane to be collected as pure water. While the water-repellency of the membrane surface has been considered an important parameter affecting the distillation efficiency, the resistance of the membrane to the contamination due to salt has gathered little scientific interest thus far. Here we experimentally investigate the precipitation of salt in sessile saline water drops, to find drastic differences in salt crystallization behavior depending on the water-repellency of solid surface. On a moderately hydrophobic surface with a static contact angle with water being about 150 degrees, salt crystals are aligned and stacked along the initial contact line, forming an interesting structure resembling an igloo. On a superhydrophobic surface with about 164 degrees of static contact angle with water, salt crystallizes only at the center of the drop-solid contact area, forming a pebble-shaped structure. We explain this difference by comparing the evaporation modes (constant contact radius versus constant contact angle) of the sessile drops on those surfaces. We also visualize the liquid flow within drops undergoing evaporation and precipitation at the same time using PIV.

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