

Abstract Submitted
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Painting Pictures with Whisky HYOUNGSOO KIM, FRANÇOIS BOULOGNE, EUJIN UM, IAN JACOBI, HOWARD STONE, Princeton University — Have you ever looked at the dried mark of whisky on the glass? While the whisky evaporates, various solid components inside the whisky are deposited with a peculiar pattern, which creates a beautiful picture. This particle patterning is induced by the solutal Marangoni effect. We investigate this effect on both the flow behavior and the particle deposition patterns in binary-mixture droplet evaporation by varying the concentration ratio between ethanol and water. To visualize the particle and fluid motion, we perform Particle Image Velocimetry. We observe that at the beginning stage complex circulating flow patterns occurred, which are triggered by the surface tension gradient, i.e. Marangoni effect. Ethanol first evaporates due to the lower vapor pressure compared to water. When the ethanol has vanished, a radial flow pattern is observed. Furthermore, we find that as the initial ethanol concentration increases, the mobility of the receding contact line increased. At high ethanol concentrations, the contact line kept receding so as to draw groups of particles that deposited in an annular pattern. We thank Ernie Button for sharing with us many beautiful images of whisky after it had dried.

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