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An Evaporating Ouzo Drop on a Superamphiphobic Surface HUANSHU TAN, CHRISTIAN DIDDENS, MICHEL VERSLUIS, University of Twente, HANS-JÜRGEN BUTT, Max Planck Institute for Polymer Research, XUEHUA ZHANG, Royal Melbourne Institute of Technology University, DETLEF LOHSE, University of Twente — The Greek drink Ouzo (or Pastis or Raki) is a miscible solution and primarily consists of water, ethanol and anise oil. Recently, we discovered how the preferential evaporation of ethanol triggers the ouzo effect, i.e. the spontaneous nucleation of oil microdroplets, in an evaporating ouzo drop [PNAS 113, 86428647 (2016)]. In this work, we performed evaporation experiments on a superamphiphobic, which is both superhydrophobic and superoleophobic, to achieve low wettability for the ouzo drops. The ouzo drops initially hold a large static contact angle (larger than 150°). Thus the singularity at the three phase contact line is absent. Codetermined by the evaporation flux distribution and volatility difference between water and ethanol, the evaporation-triggered ouzo effect preferentially occurs at the apex of the drop. During the evaporation process, two distinct slopes characterize the volume decrease of the drop. Theoretically, based on Popovs diffusion model for quasi-steady natural evaporation of pure liquid drops, we propose an approximate diffusion model for the drying characteristics of ouzo drops with more than one component. The generalized diffusion model predicts the evaporation of the drops in agreement with experiment and numerical simulation results.

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