Supplementary Information

Effect of Surface Tension on Elastocapillary Wrinkling of Interfacially Adsorbed Hydrogel Disks with Photothermally Programmed Swelling Profiles

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Figure S1. Optical microscope images of patterned hydrogel disks with different thicknesses.



Figure S2. The red circles correspond to the radial temperature profile for a hydrogel disk at the air-water interface subject to illumination, as obtained via finite element modeling in our previous work¹. The x-axis indicates the distance from the center of the circular hydrogel disk. The black curve represents the best-fit equation written as an inset which was used here to approximate the temperature profile.



Figure S3. A series of optical microscope images of hydrogel disks (a) at the air-water interface and (b) within a bulk solution with different concentrations of polyvinyl alcohol (PVOH), from left to right: 0%, 0.2%, 0.5%, 1.0%, 2.0% (w/w).



Figure S4. An optical microscope image of hydrogel disks with thickness 2.3 μ m folded in a bulk aqueous solution.



Figure S5. A plot comparing the air-water surface tension to the resulting strain on the hydrogel disks. The solid lines represent best fits with fixed intercept at (0,47).

Description of Supporting Movies

Movie S1. Illumination of a patterned hydrogel disk adsorbed at the interface of five different PVOH solutions (playback at 4x real time).

References

1. H. Kim, J.-H. Kang, Y. Zhou, A. S. Kuenstler, Y. Kim, C. Chen, T. Emrick, R. C. Hayward, *Adv. Mater.*, 2019, **31**, 1900932.