

Abstract Submitted  
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**Towards cost-effective, solution processed, encapsulant films for organic electronic devices – controlling flow instabilities during film formation** JIMMY GRANSTROM, Mitsubishi Chemical Center For Advanced Materials, ANSHUMAN ROY, GRIFFIN ROWELL, JI SUN MOON, EVAN JERKUNICA, ALAN HEEGER, Center for Polymers and Organic Solids — We present a general method for making thin and smooth films of a water-repelling perfluorinated polymer. These films function as encapsulation barrier layers against water and oxygen permeation. Based on a phenomenological analysis, we find that disturbances in flow due to the Rayleigh-Benard-Marangoni instability during drying of spin-cast perfluorinated polymer films cause high surface roughness and the formation of “pinholes.” Atomic Force Microscopy measurements show that this instability can increase the surface roughness by an order of magnitude. Casting films from solutions with higher polymer concentration and from solvents with higher viscosity suppress the instability and significantly reduce the roughness. Suppression of the instability results in improved barrier properties as indicated by the calcium thin film optical transmission test.

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