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Photocrosslinking induced phase separation in evaporating solvents: formation of skin layers and microspheres[1] LIANG WANG, YIFU DING, Univ of Colorado - Boulder — We study the structure formation of films obtained via photocrosslinking of precursors during the evaporation of solvents. Although most precursor/solvent systems result in uniform dense films after the process, reaction induced phase separation (RIPS) can occur in solvents with a unique combination of solubility, evaporation rate and ratio of latent heat to heat capacity. The RIPS in evaporating solvents results in highly hierarchical film morphology, featuring a skin layer atop a particulate layer. The influence of the processing parameters on skin layer thickness including N_2 flowrate, UV intensity and precursor concentration were investigated. Alongside, a theoretical model, based on the one for non-crosslinked polymer solution is developed, which can qualitatively interpret the skin layer formation and its dependence on processing parameters.

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