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Quenching Phase Separation by Vapor Deposition Polymerization RAN TAO, MITCHELL ANTHAMATTEN, University of Rochester — Initiated chemical vapor deposition (iCVD) is a solventless, free radical technique predominately used to deposit homogeneous films of linear and crosslinked polymers directly from gas phase feeds. We report a template-free method to fabricate continuous-phase porous polymer films by simultaneous phase separation during iCVD. Phase separation during film growth is achieved by condensing an inert porogen, along with initiator, monomer, and crosslinker. When the vapor mixture transports to the cooled substrate, phase separation occurs along with polymerization and crosslinking, which quench the state of phase separation. The kinetics of spontaneously phase separation can be qualitatively understood on the basis of Cahn-Hilliard theory. A series of films were grown by varying monomer and porogen's degree of saturation. Deposited films were studied by electron microscopy and spectroscopic techniques.

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