

Abstract Submitted
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Highly Swollen Porous Microstructures in Polyelectrolyte Multilayers CHUNGYEON CHO, JEREMY KAISER, NICOLE ZACHARIA — We investigated the creation of porous morphologies from polyelectrolyte multilayers (PEMs) consisting of linear poly(ethylenimine) and poly(acrylic acid), and poly (allylamine hydrochloride) and poly (acrylic acid) as a function of pH and immersion time under post-base assembly treatment. The porous transition is linked to the neutralization of the polycations electrolytes as well as ionization of PAA by the exposing LbL films to high pH. This causes PEMs to undergo spinodal decomposition, creating pores and an increase in film thickness. By using reactive wet stamping technique, we were able to locally cause porosity changes under high pH conditions in the LbL films. Further investigation of the mechanical properties of patterned LbL films was done by performing nano-indentation analysis. The results showed clear difference of physical properties such as hardness and modulus between stamped and unstamped regions based on porous transition.

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