

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Spray Deposition of Multilayer Gas Barrier Thin Films TARA GIVENS, FANGMING XIANG, JAIME GRUNLAN, Texas A&M Univ — Dip-assisted assembly is the norm for making multilayer thin films (also known as layer-by-layer [LbL] assembly). Spray-based deposition possesses several advantages over dipping, but has not been studied in great detail, especially for gas barrier layers. In this study, polyethylenimine [PEI]/poly(acrylic acid) [PAA] bilayers were deposited with varying spray parameters. Spraying time was found to be the most influential parameter to control the roughness, thickness, and gas barrier of the PEI/PAA assembly. A spray-coated sample was prepared using optimized parameters and compared to a dip-coated sample using the same deposition time (5s). The sprayed sample was better in terms of thickness, roughness, and gas barrier. This study is the first report showing that a sprayed multilayer assembly has better properties than its dipped counterpart. These findings could revolutionize the multilayer deposition process, making it more commercially-friendly.

Tara Givens
Texas A&M Univ

Date submitted: 12 Nov 2014

Electronic form version 1.4