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Spray-assisted layer-by-Layer (LbL) assembly of anisotropic materials SOUVIK DE, PILAR SUAREZ MARTINEZ, AVANTI KAVARTHAPU, JODIE LUTKENHAUS, Department of Chemical Engineering at Texas A&M University — Layer-by-layer (LbL) assembly has gained tremendous interest as it allows one to incorporate a large variety of molecules with nano-scale precision and very good reproducibility. In addition to charged polymers, the technique has become extremely popular to fabricate tailor-made thin films containing anisotropic nanomaterials (e.g., graphene oxide sheets). The challenge is that a standard protocol to fabricate “all-polyelectrolyte” LbL films may not necessarily give rise to satisfactory film growth when applied to LbL assembly where one of the adsorbing components is an anisotropic nanomaterial. Therefore, in this contribution, we combine polymers and anisotropic nanomaterials via dip- and spray-assisted LbL assembly and investigate the effect of charge density, exfoliation, concentration etc. of the components on the growth behavior and the film quality. The end result is a conformal, pin-hole free coating on model substrates (glass, silicon, metal) over a large area.

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