

Abstract Submitted  
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**Flame Retardant Polyelectrolyte-Nanoclay Layer-by-Layer Assemblies on Cotton**<sup>1</sup> GALINA SUKHONOSOVA, YU-CHIN LI, JAIME GRUNLAN, Texas A&M University — Thin composite films of branched polyethylenimine (BPEI) and Laponite clay platelets were prepared using layer-by-layer assembly. Film thickness was tailored by altering the pH of the aqueous mixtures used to deposit these films, resulting in growth that ranged from 0.5 to 5 nm per bilayer. In all films, the clay platelets are uniformly deposited and look analogous to a cobblestone path in atomic force microscopy (AFM) surface images. These thin coatings were deposited onto cotton fabric and the fabric has significantly more char left after burning than the uncoated fabric. Thermogravimetric analysis (TGA) results reveal that fabric coated with 10-bilayers of BPEI-Laponite produces up to 6 wt% char at 500 °C, which is almost an order of magnitude greater than untreated fabric. This study demonstrates that polymer-clay assemblies could improve the thermal stability of cotton and may be useful for fire safety applications.

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