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Synthesis and Characterization of Organic Thin Film Using Atmospheric-Pressure Plasma Polymerization

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We developed a novel method of fabricating polymer film on a substrate at atmospheric pressure using atmospheric-pressure plasma polymerization (APPP) with a laboratory-made torch-type APPP apparatus. We used allylamine and acrylic acid as model monomers to optimize the polymerization conditions and evaluate the fabricated films. The APPP films were characterized by Fourier transform infrared (FT-IR) spectroscopy, contact angle measurement, atomic force microscopy (AFM), ellipsometry, X-ray photoelectron spectroscopy (XPS), deposition rate determination, and persistence measurement. Results showed that the properties of the APPP allylamine and acrylic acid films can be controlled by adjusting the polymerization parameter of ultrahigh-frequency power.

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