

# Plasma polymer films: From nanoscale synthesis to macroscale functionality

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Plasma-polymerized organosilicones constitute a class of materials with a rich and varied scientific background. This class of materials possesses a special characteristic, which distinguishes it from other plasma polymers – the ability to vary and control the degree of its organic/inorganic character and polymer cross-linking by the appropriate choice of fabrication variables. This allows one to control many physicochemical properties over wide ranges resulting in an extraordinary potential for useful applications, which are only now beginning to be tapped. The organosilicon plasma polymers are widely recognized for their potential not only in optical and electronic applications, but also in composites and nanocomposites with controlled interphase. Nanoscale synthesis of plasma polymers will be explained together with principles of controlled film properties and macroscale functionality will be demonstrated using tailored interlayers for fiber reinforced composites with superior performance.