

Adsorption and Surface Properties of Organosilane Self-Assembled Monolayer on the Silicon Surfaces

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Thin polymer films play a central role in modern micro- and nanotechnologies. Especially, self assembly (SA) layers are very important in functionalizing sensors surfaces. In this study, monolayer and multilayer films were formed by self assembly of octadecyltrichlorosilane [$\text{CH}_3(\text{CH}_2)_{17}\text{SiCl}_3$] from organic solution. The use of derivatives of alkytrichlorosilanes results in monomolecular layer which are durable, thermally stable, and resistant to degradation by a variety of strong reagents. This compound was found to form good quality, close-packed monolayers on SiO_2/Si surfaces. The aggregation structure of the monolayers was investigated on the basis of transmission electron microscopic (TEM), atomic force microscopic (AFM) and ellipsometry. The surface chemical composition of the monolayers was investigated by using attenuated total reflection Fourier transformed infrared (ATR-FT-IR) spectroscopy and X-ray photoelectron spectroscopy (XPS). The stability of the monolayer was investigated by dynamic contact angle measurement.