380b Molecular Vapor Deposition for Enhanced Monolayer Stability and Durability

B. Kobrin, W. Robert Ashurst, V. Fuentes, R. Nowak, R. Yi, and Jeff Chinn

A new molecular vapor deposition technique (MVD) is described, which provides a method of surface modification for a variety of substrate materials. The method involves remote plasma treatment followed by the application of an adhesion promoting layer and functional organic layer deposition in a single vacuum chamber without substrate transfer. The general MVD method may be carried out in several modes which produce different film qualities. Three incarnations of MVD include "Vapor SAM", where one precursor is deposited, "Sequential", where two precursors are deposited consecutively, and "Cross-linked", where two (or more) precursors are simultaneously deposited. The MVD methods are used in a variety of material systems, and show distinct advantages (including greater film stability with respect to aqueous immersion and thermal cycling) over conventional liquid processing.