



Direct Electron-Beam Patterning of Surface Coatings and Sacrificial Layers for Micro-Total Analysis Systems

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Carbon-based materials were patterned by electron-beam lithography for applications in micro-total analysis systems. A heat-depolymerizable polycarbonate (HDP) layer on silicon was demonstrated as a sacrificial layer for forming microfluidic channels. Lines of HDP were patterned by electron beam lithography and an oxide capping layer was deposited. HDP was then removed from the oxide channels by heating. Coating materials for micro-total analysis systems were also investigated. Self-assembled monolayer coatings were directly patterned by electron beam lithography, then chemically treated to have the desired surface properties. The resulting chemical templates were used to pattern biomolecules and particles of interest for micro-total analysis systems.

Keywords: electron-beam lithography, microfluidics, self-assembled monolayers, heat-depolymerizable polycarbonate