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TF2+2D+AP+SS: ALD and CVD: Surface Reactions, Mechanisms, and Kinetics

Insight into Film Growth Mechanisms in Polyurea Molecular Layer Deposition Using New and Combined Precursors

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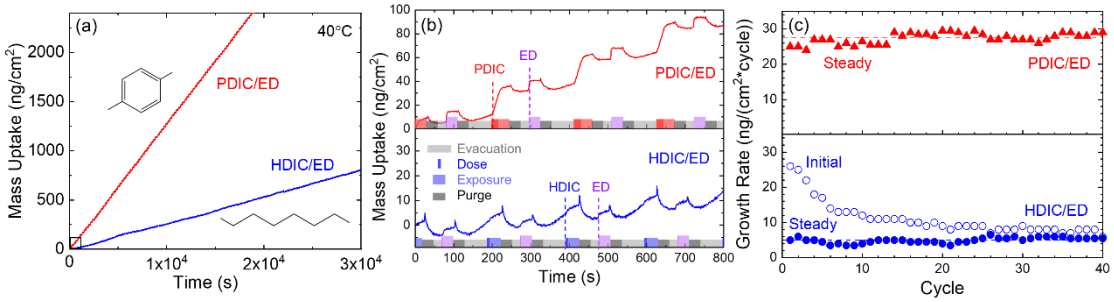

Figure 1: QCM data of polyurea deposited from PDIC/ED (red) and HDIC/ED (blue) at 40 °C. (a), (b) mass uptake versus time, and (c) mass growth rate versus cycle. A higher growth rate is demonstrated for the more rigid PDIC/ED film. Additionally, a decreasing growth rate is observed for initial HDIC/ED growth on a metal oxide (Al_2O_3) substrate compared to deposition on the bulk polymer.

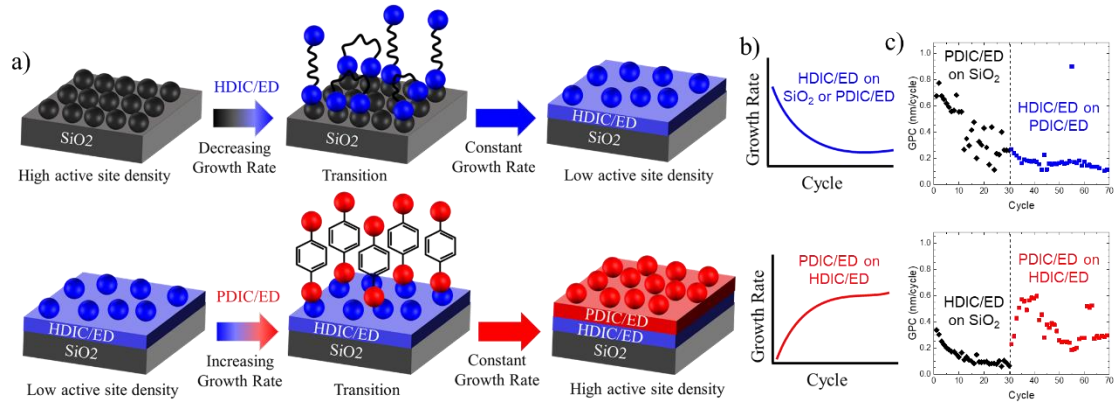

Figure 2: (a) Schematic of polymer growth on various substrates. Flexible HDIC/ED (aliphatic) has a decreasing growth rate on SiO_2. During subsequent PDIC/ED (aromatic) deposition on the aliphatic surface, the growth rate increases corresponding to increasing active sites. (b) Expected and (c) actual growth rates (in situ ellipsometry) for each polymer deposited on various substrates (SiO_2, aromatic polymer, or aliphatic polymer).