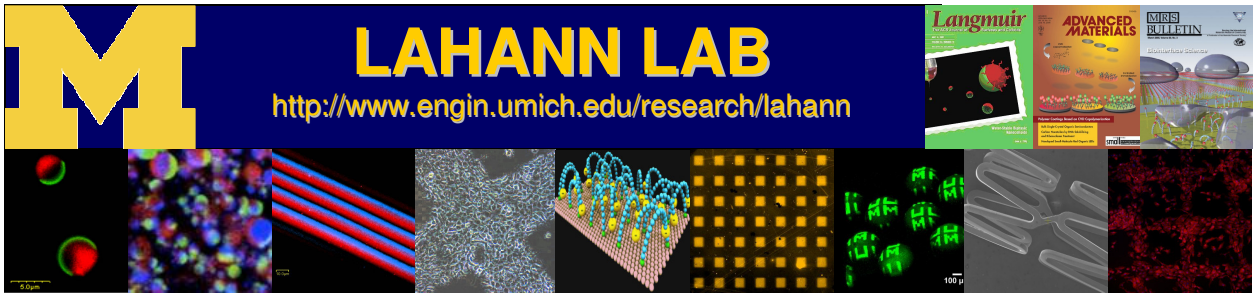


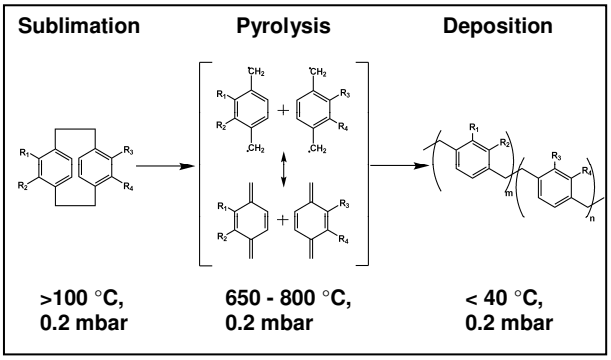
Vapor-based reactive coatings

Background

Surface modification of complex substrates has emerged as one of the key challenges. In this respect, vapor-based polymer coatings have garnered a lot attention as compared to wet-chemical approaches and are applicable to a diverse range of polymerizations. However, these coatings have been hampered by the lack of anchors groups and reactive functionalities for further surface modification.

Technology

We have fabricated a versatile class of reactive poly-p-xylylene coatings using chemical vapor deposition (CVD) polymerization of functionalized [2.2]paracyclophanes. Our custom-built CVD system has also enabled us to create polymer coatings which present multiple functional groups simultaneously. We have further demonstrated the applicability of these coatings towards biomimetic and spatially-directed surface engineering.



Applications

- Covalent immobilization of ligands
- Surfaces with chemical gradients
- Dry-adhesion bonding
- Biomedical device coatings (stents, grafts, scaffolds)
- Microfluidic device coatings
- Cell culture substrates
- Non-fouling surfaces

Advantages

- Solvent-free, room-temperature process
- Good adhesion on a wide range of substrates
- Provides chemically reactive functional groups
- Applicable to 3-D and complex geometries

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