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Sequentially self-limited molecular layer deposition of uniformly aligned polyurea thin films

Jin Seok Lee

Sookmyung Women's University, South Korea

Development of methods enabling the preparation of uniformly aligned polymer thin films at the molecular level is a prerequisite for realizing their optoelectronic characteristics as innovative materials; however, these methods often involve a compromise between scalability and accuracy. In this study, we have grown uniformly aligned polyurea thin films on a SiO₂ substrate using molecular layer deposition (MLD) based on sequential and self-limiting surface reactions. By integrating plane-polarized Fourier-transform infrared, Raman spectroscopic tools and density functional theory (DFT) calculations, we demonstrated the uniform alignment of polyurea MLD films. Furthermore, the selective-wavelength absorption characteristics of these films were investigated by integrating optical measurements and finite-difference time-domain (FDTD) simulations of reflection spectra, resulting from their thickness-dependent fine resonance with photons.

Biography

Jin Seok Lee has completed his PhD from Sogang University and Post-doctoral studies from Harvard University, Department of Chemistry and Chemical Biology. He is an Associate Professor of Chemistry in Sookmyung Women's University. He has published more than 45 papers in reputed journals.

jinslee@sookmyung.ac.kr

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