

Molecular layer deposition of organic-inorganic hybrid films showing enhanced photocatalytic activity towards decomposition of benzoic acids in aqueous solutions

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Highly active photocatalytic layers capable of efficient decomposition of adsorbed dye molecules as well benzoic acids in aqueous solutions are demonstrated. The photocatalytic layers are prepared using Molecular Layer Deposition (MLD). MLD is a promising approach for the formation of organic-inorganic hybrid thin film materials with well-controlled properties. MLD allows the application of such films to nanometric scaffolds and templates, together with high molecular permeability, without the addition of surfactants to yield enhanced photocatalytic architectures. Such materials and structures are desirable for the formation high surface area nanometric building blocks with controlled surface properties and functionality leading to highly favorable catalytic activity of the nanometric hybrid structures. Our results demonstrate the feasibility and high potential of using MLD process to high aspect ratio and high activity films for photocatalysis. The details of film properties, thermal anneal process, and nanometric scale architecture structure and relation to the photocatalytic activity enhancement will be discussed.

Biography

Roie Yerushalmi received his Ph.D. from the Weizmann Institute of Science, Israel in 2005. During His Post-Doctoral studies at Berkeley Roie focused in the study of nanometric scale systems with emphasis on nanostructure synthesis, characterization and assembly. Since October 2008 he is a senior lecturer at the Institute of Chemistry, the Hebrew University of Jerusalem and a member of the Harvey M. Krueger Center for Nanoscience and Nanotechnology. His current research interests are related to surface chemistry at nanostructured interfaces, the design and synthesis of hybrid nanostructures for photocatalysis and for the harvesting of light energy.

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