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Molecular-Level Insulation: An Approach to Controlling Interfacial Charge Transfer JONG SEUNG PARK, MOHAN SRINIVASARAO, School of Polymer, Textile and Fiber Engineering, School of Chemistry and Biochemistry, Center for Advanced Research in Optical Microscopy (CAROM), SAIF A. HAQUE, JAMES R. DURRANT, Centre for Electronic Materials and Devices, Department of Chemistry, Imperial College of Science Technology and Medicine, London SW7 2AZ, U.K., GEORGIA INSTITUTE OF TECHNOLOGY TEAM, IMPERIAL COLLEGE OF SCIENCE TECHNOLOGY AND MEDICINE TEAM
— In this presentation, we report a novel approach to the attachment of molecular dyes to nanocrystalline TiO_2electrodes. New azo dye rotaxane was synthesized by encapsulating an organic dye inside cyclodextrin, and it is shown to exhibit strong binding to the metal oxide electrode. The encapsulation results in a well-defined spatial separation of the organic dye from the electrode surface, allowing the photogeneration of a long-lived charge separated state. Herein we demonstrate that such cyclodextrin threaded sensitizer dye rotaxanes can be used to functionalise nanocrystalline TiO_2, resulting in a long-lived photogenerated charge separation.

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