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NANOELECTRONICS BASED ON ULTRA-ROBUST METAL-TERPYRIDINE OLIGOMER COMPLEXES AND ON OPTICAL MOLECULAR SWITCHES

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Considerable efforts have been undertaken within the past decades to shift organic-based thin-film devices from basic research to the application level. In this talk, avenues toward the realization of organic electronics on the basis of ultrathin functional organic layers are outlined, specifically by leveraging on the self-assembly process at interfaces. In the first part, we show how large area molecular junctions of outstanding robustness can be realized using densely packed molecular metal-terpyridine complex oligomers, which might enable a versatile platform for functional optoelectronic layers. In the second part, a new class of self-assembled monolayers exhibiting a pronounced intrinsic dipole moment is presented, by which the injection properties in organic semiconductors can be tuned in view of in solar cell and organic memory applications. Finally, as an example for biomolecular photoconductors, Sn-cyt c protein layers are shown to act as reversible photo-electrochemical switches upon integration into large area solid state junctions. The underlying modulation in charge transfer rate is attributed to a hole-transport channel, created by the photoexcitation of the Sn-porphyrin.

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