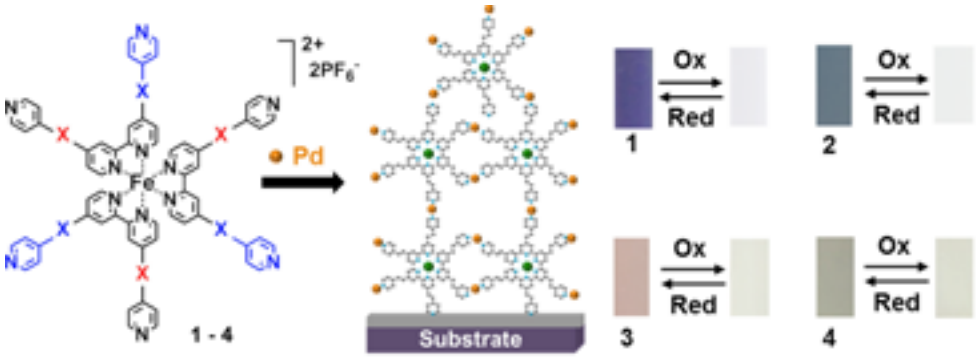
Michal Lahav, J Phys Chem Biophys 2017, 7:2(Suppl)
DOI: 10.4172/2161-0398-C1-019

Metallo-organic assemblies as electrochromic materials: Switching stability, coloration efficiencies and devices

Michal Lahav
Weizmann Institute of Science, Israel

Stepwise deposition from solution, combined with metal-ligand coordination, has served as a powerful tool for generating functional architectures on surfaces. Such systems might find many applications in molecular electronics, sensor and solar cells. More significantly, owing to their interesting electrochromic (EC) behavior, redox-active metallo-organic assemblies are promising candidates for use in smart windows. In this study, we used a dip-coating process to generate EC molecular assemblies (MA) from metal polypyridyl complexes cross-linked with a palladium salt. These complexes are considered ideal chromophores for fabricating EC materials, due to their excellent stability and light absorption that significantly depends on their oxidation state. Varying the number of pyridine moieties was used to control (i) the materials' stability, (ii) color, (iii) redox-chemistry and (iv) the film growth (i.e., linear vs. exponential). Our observations also demonstrated that minor structural differences (i.e., the pyridine-bi-pyridine bond order, X) at the molecular level become apparent in stability and EC properties, (Figure 1). The MAs exhibit very high coloration efficiencies (CEs) and are extremely stable. Furthermore, we demonstrate solid-state devices.



Biography

Michal Lahav has completed her BSc and PhD studies in Chemistry in 2001 at the Hebrew University of Jerusalem. She was a Post-doctoral Researcher at the Weizmann Institute of Science for two years before she moved to Harvard University, where she studied nano-chemistry. After two years of Post-doctoral work in the United States, she returned to Israel and started to work as a Scientific Advisor at the Weizmann Institute of Science. She was appointed as an Associate Staff Scientist in the Department of Organic Chemistry in 2011. Her interdisciplinary Materials Chemistry Research is related to the self-assembly of metallo-organic materials for energy storage and for electro-chromics whose products are now being patented. Her work is related to fundamental understanding of the formation and electronic properties of these metallo-supramolecular architectures. Her prizes and honors include the Dr. Maxine Singer Prize for Outstanding Staff Scientists, the Baruch Zinger Award for Academic Excellency, the IVS Excellence Award for Surface Science Expertise and the Schmidt Prize.

michal.lahav@weizmann.ac.il

Notes: