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An Electric Field Stimulated Spin Crossover Transition in a Molecular Adsorbate XIN ZHANG, Department of Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, NE, US., TATIANA PALAMARCIUC, PATRICK ROSA, JEAN-FRANÇOIS LÉTARD, CNRS, ICMCB, Groupe des Sciences Moléculaires, Université de Bordeaux, Pessac, France, EDUARDO V. LOZADA, FERNAND TORRES, L.G. ROSA, Dept. of Physics and Electronics, University of Puerto Rico - Humacao, Humacao, PR, US, BERNARD DOUDIN, Institut de Physique Applique de Physique et Chimie des Matériaux de Strasbourg, 3 Université Louis Pasteur Strasbourg, Strasbourg, France, PETER A. DOWBEN, Department of Physics and Astronomy, University of Nebraska-Lincoln, Lincoln, NE, US. — We have investigated the occupied and unoccupied electronic structure of ultra thin films of the spin crossover [Fe($H_2B(pz)_2)_2$(bipy)] complex (with $H_2B(pz)_2$ = bis(hydrido)bis(1H-pyrazol-1-yl)borate and bipy = 2,2'-bipyridine) by ultraviolet photoelectron spectroscopy (UPS), inverse photoemission (IPES) and X-ray absorption spectroscopy (XAS). A bandgap of 2-3 eV is deduced from combined UPS and IPES measurements of the films on Au substrates. The shift of the unoccupied density of states seen in IPES is consistent with the thermally induced spin crossover transition for molecules deposited on the organic ferroelectric copolymer polyvinylidene fluoride with trifluoroethylene (PVDF-TrFE). Perhaps more significant is the fact that the spin crossover transition, and certainly the unoccupied electronic structure, is influenced by the ferroelectric polarization direction of PVDF-TrFE substrates at temperatures in the vicinity of the thermally driven spin crossover transition.

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