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Electronic structure and energy level alignment of zinc and free-base tetraphenylporphyrin derivatives adsorbed on ZnO(11-20) SENIA KATALINIC, KEYUR CHITRE, SYLVIE RANGAN, ELENA GALOPPINI, ROBERT BARTYNSKI, Rutgers University — Tetraphenylporphyrin dye molecules are studied extensively as possible candidates for the active layer in dye-sensitized solar cells. Still, many fundamental properties of the dye/metal oxide interface are not known and need careful consideration. Using direct and inverse photoemission we have measured the occupied and unoccupied electronic states as well as the energy level alignment of several zinc and free-base tetraphenylporphyrin derivatives adsorbed on ZnO (11-20). For a full interpretation of the electronic structure, we have compared these measurements to ab-initio calculations. UV-visible absorption properties of these dyes were also obtained. In addition to the spectroscopic surface averaged probes, we have used scanning tunneling microscopy to study local bonding geometries at the surface. Recent results will be presented.

Senia Katalinic
Rutgers University

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