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Electronic Structure of Potassium-doped Magnesium Phthalocyanine measured using Soft X-ray Spectroscopies. YUFENG ZHANG, SHANCAI WANG, LEYLA COLERKEROL, TIMOTHY LEARMONTH, LUKASZ PLUKINSKI, KEVIN SMITH, Boston University, JAMES DOWNES, SCPS, Victoria Univeristy of Wellington, ANNE MATSUURA, Air Force Office of Scientific Research — We report a synchrotron radiation-excited resonant soft x-ray emission spectroscopy (XES) study of the electronic structure of magnesium phthalocyanine (MgPc) doped with potassium. XES measures directly the element specific partial density of states (PDOS) in solids. The electronic structure near the Fermi level in organic systems can be accurately measured by using this non-ionizing spectroscopy. The MgPc films were grown *in-situ* by using a custom designed ultra-high vacuum organic molecular beam deposition system, and transferred under vacuum to the spectrometer system. As with our earlier study of Cu-Pc and vanadium oxide phthalocyanine (VO-Pc), the K-doped MgPc films were discovered to be highly susceptible to synchrotron radiation beam damage. We successfully circumvented this effect by continuous translation of the films during measurement. We find that the measured C $2p$ PDOS for K-doped MgPc differs from that of pure MgPc, and will discuss the possible origins of these results. Supported in part by ACS Petroleum Research Fund, and by the NSF. Experiments were performed at the NSLS.

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