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I3+-Ir4+ Charge Disproportionation of Spinel CuIr2S4 investigated by Synchrotron Radiaton Photoemission HAN-JIN NOH, E.-J. CHO, Dep. of Phys., Chonnam National University, H.-D. KIM, J.-Y. KIM, Pohang Accelerator Laboratory, POSTECH, C.-H. MIN, School of Phys. and Astron., Seoul National University, B.-G. PARK, Dep. of Phys. POSTECH, S.-W. CHEONG, Rutgers Center for Emergent Materials, Rutgers University — We have studied the electronic structure of the spinel $CuIr_2S_4$ using synchrotron-radiation photoemission spectroscopy. The phase transition from a high temperature paramagnetic metal to a low temperature diamagnetic insulator at $\sim$230 K is clearly observed through the significant line shape change of the Ir $4f$ photoemission spectra and the $\sim$0.09 eV gap opening of the valence band spectra. The photon energy dependence of the Ir $4f$ photoemission spectra enable us to characterize the satellite peaks in the metallic phase of $CuIr_2S_4$, providing compelling experimental evidence for the Ir^{3+}-Ir^{4+} charge disproportionation in $CuIr_2S_4$.

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