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Photoemission study on pyrochlore ruthenate
(Bi,Y)₂Ru₂O₇

박종혁, 김기훈, 오세정
서울대학교 물리학과

We have performed the photoemission study on the cubic pyrochlore ruthenate (Bi,Y)₂Ru₂O₇ using synchrotron radiation at Pohang Light Source. This system Bi_xY_{2-x}Ru₂O₇ is known to show metal-insulator transition as x decreases and Y₂Ru₂O₇ is considered as Mott insulator. We observed the clear gap opening below the fermi energy, and its magnitude is consistent with the activation gap from the previous transport measurement. Using the relative change of photoionization cross-section between Ru 4d and O 2p depending on the photon energy, we can deduce the partial spectral weight of Ru 4d and O 2p from the measured spectra of occupied states. The resonant photoemission spectra taken at the Ru 4p->4d edge also give the similar information about the valence band as the former technique using so-called 'Cooper minimum' of Ru 4d. To explain the metal-insulator transition in this system, we compared our data with the well-known Mott-Hubbard criterion and found that the electron-electron correlation is also important in the 4d electron system although we should take into consideration other effects like local lattice distortion affecting the strength of hybridization between Ru 4d and O 2p states.