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Localization of holes at oxygen sites in a thermoelectric rhodate revealed by photoemission spectroscopy ISHIDA YUKIAKI, BABA TERUHISA, RIKEN SPring-8 Center, EGUCHI RITSUKO, MATSUNAMI MASAHARU, ISSP U. Tokyo, TAGUCHI MUNETAKA, CHAINANI ASHISH, RIKEN SPring-8 Center, SENBA YASUNORI, OHASHI HARUHIKO, JASRI/SPring-8, OKAMOTO YOSHIHIKO, ISSP U. Tokyo, TAKAGI HIDENORI, RIKEN, SHIN SHIK, RIKEN SPring-8 Center & ISSP U. Tokyo — We have performed soft-x-ray absorption and photoemission studies on Sr1-xRh2O4 [1], a thermoelectric material structurally and electronically analogous to NaxCoO2. Metal-insulator transition occurs with hole doping into the Rh 4d t2g band via introducing Sr vacancies [1]. Valence-band spectra of Sr1-xRh2O4 showed satellite structures ∼11 eV below the Fermi level, which cannot be explained by LDA or LDA+U calculations. The O 1s2p2p Auger peak in the photoemission spectra appeared from the 11-eV satellite in the vicinity of the O 1s absorption edge, indicating that the satellite is a sign of holes localized at oxygen sites. Concomitantly, doping dependent changes appeared mainly in the O 1s absorption spectra rather than in the Rh 3p3/2 absorption spectra. We discuss inhomogeneous evolution of the system with hole doping along with Sr-vacancy potential and d-p hybridization. [1] Y. Okamoto, et al., J. Phys. Soc. Jpn . 75, 023704 (2006).

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