

Polarization dependent hard X-ray photoemission

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Background

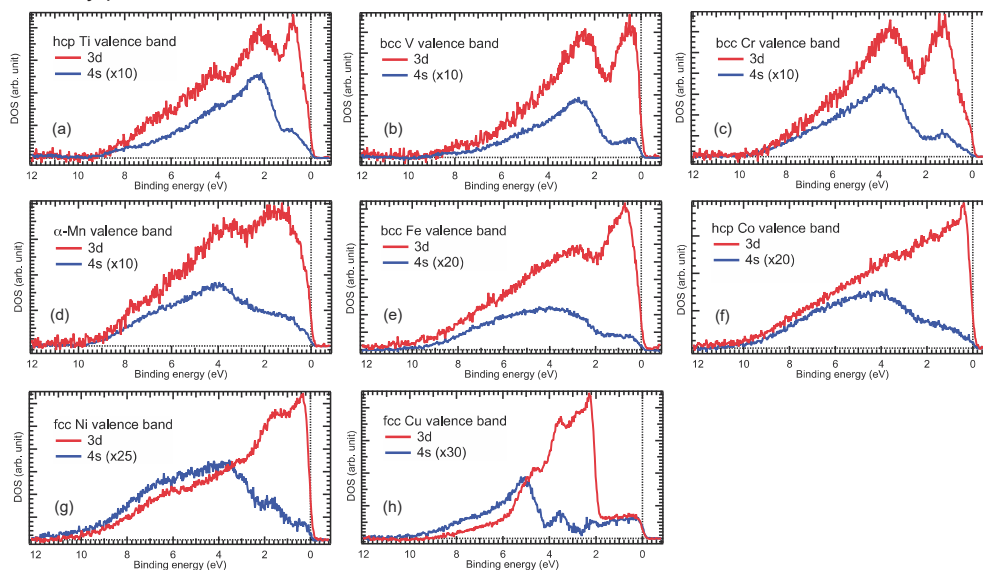
- Application of hard X-ray photoelectron spectroscopy (HAXPES) to advanced materials.
- Fundamental dataset of valence band HAXPES spectra is required.
- Analysis of the electronic structures of advanced materials from the fundamental dataset.

Aim

- Building a database of the polarization dependent valence band HAXPES spectra.
- Determination of the relative photoionization cross-section of the atomic orbitals.
- Extraction of partial densities of states from polarization dependent HAXPES spectra.

Advanced Research Topics

Experimentally obtained 3d and 4s partial densities of states by polarization dependent HAXPES, by utilizing that the photoionization cross-section of 4s orbital strongly depends on X-ray polarization.



Publications

- S. Ueda and I. Hamada, J. Phys. Soc. Jpn. **86**, 124706 (2017).

Summary

- We have obtained the polarization dependent valence band HAXPES spectra of 3d TMs.
- Relative photoionization cross-section is determined.
- Extraction of 4s and 3d partial densities of states from the experimental spectra of 3d TMs.

Research outcome

- We expand the dataset of 4d, 5d TMs, and group IV elements.
- Building a database of the valence band spectra and cross-sections for most of elements.
- Application of the database to basic and practical research.