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# Orbital Character of the Conduction Band of Delafossite PdCoO<sub>2</sub> Studied by Polarization-Dependent Soft X-Ray Absorption Spectroscopy

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We present the x-ray absorption spectra that show the Co valence state and the orbital character of the conduction band of delafossite PdCoO<sub>2</sub>. The Co 2p x-ray absorption spectra of PdCoO<sub>2</sub> and PtCoO<sub>2</sub> show that the Co ions have the trivalent low-spin configuration. The polarization dependent O 1s absorption spectra reveal that the unoccupied density of states (DOS) near the Fermi level consists mainly of the Pd 4d 3z<sup>2</sup>-r<sup>2</sup> states. The experimental O 2p<sub>z</sub> partial DOS (PDOS) is extracted from the polarization dependent O 1s spectra and is compared with the theoretical PDOS by the local density approximation, showing a good agreement. These observations provide a consistent picture on the origin of the good conductivity of the delafossite oxides.