

Valence states and spin structure of spinel FeV_2O_4 with different orbital degrees of freedomJ.-S. Kang,^{*} Jihoon Hwang, D. H. Kim, and Eunsook Lee*Department of Physics, The Catholic University of Korea (CUK), Bucheon 420-743, Korea*

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The electronic structure of spinel FeV_2O_4 , which contains two Jahn-Teller active Fe and V ions, has been investigated by employing soft x-ray absorption spectroscopy (XAS), soft x-ray magnetic circular dichroism (XMCD), and nuclear magnetic resonance (NMR). XAS indicates that V ions are trivalent and Fe ions are nearly divalent. The signs of V and Fe $2p$ XMCD spectra are opposite to each other. It is found that the effect of the V $3d$ spin-orbit interaction on the V $2p$ XMCD spectrum is negligible, indicating that the orbital ordering of V t_{2g} states occurs from the real orbital states and that the orbital moment of a V^{3+} ion is mostly quenched. NMR shows that V spins are canted to have a Yafet-Kittel-type triangular spin configuration.