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Optical study of phonons and electronic excitations in tetragonal Sr 2VO4

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Abstract

We report on the optical excitation spectra in Sr₂VO₄. The phonon modes are assigned and their evolution with temperature is discussed in the frame of the different phase transitions crossed upon cooling. Besides the expected infrared-active phonons, we observe two additional excitations at about 290 and 840 cm⁻¹, which could correspond to electronic transitions of the V⁴⁺ ions. Our experimental results are discussed in the context of recent experimental and theoretical studies of this material with a unique spin-orbital ground state. © 2011 American Physical Society.

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