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FT-IR and Raman Spectroscopic Study of Cobalt Oxides YANG LI, FAN QIN, WENLAN QIU, Department of Electrical and Computer Engineering, University of Houston, HUI FANG, Department of Physics, Sam Houston State University, VIKTOR G. HADJIEV, Texas Center for Superconductivity and Department of Mechanical Engineering, University of Houston, DMITRI LITVINOV, JIMING BAO, Department of Electrical and Computer Engineering, University of Houston — Fourier transform infrared (FTIR) and Raman spectroscopy are studied on cobalt monoxide (CoO) and cobalt dicobalt oxide (Co3O4) in the presented work. We can experimentally detect the transverse and longitudinal optical modes of Co3O4 using transmittance and diffuse reflectance (DRIFTS) measurements in FTIR, which showed good agreement with theoretical calculation. DRIFTS results also proved that Co3O4 with smaller particle size will lead to an increase in the LO-TO ratio. During the oxidation process from CoO to Co3O4, this ratio is gradually raised. CoO can be identified with a broad band near 500cm-1. For the first time, we clearly demonstrate that CoO exhibits only the second order Raman scattering near 1070cm-1 at room temperature and ambient pressure (excited by 473nm laser).

Yang Li
University of Houston

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