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Many-body large polaron optical conductivity in  $\operatorname{SrTi}_{1-x}\operatorname{Nb}_xO_3^1$ J. T. DEVREESE, S. N. KLIMIN, Theorie van Quantum en Complexe Systemen, Universiteit Antwerpen, Antwerpen, Belgium, J. L. M. VAN MECHELEN, D. VAN DER MAREL, Departement de Physique de la Matière Condensee, Universite de Genève, Genève, Switzerland — Recent experimental data on the optical conductivity of niobium doped SrTiO<sub>3</sub> are interpreted in terms of a gas of large polarons. The theoretical approach takes into account many-body effects, the electron-phonon interaction with multiple LO-phonon branches, and the degeneracy and the anisotropy of the Ti  $t_{2g}$  conduction band. The many-body large-polaron model based on the Fröhlich interaction provides a fair agreement between the theoretical large-polaron optical conductivity band and the experimental mid-infrared optical conductivity band without any adjustment of material parameters. The large-polaron model gives then a convincing interpretation of the experimentally observed optical conductivity spectra of  $\operatorname{SrTi}_{1-x}\operatorname{Nb}_xO_3$ .

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