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Luminescence-Based Characterization of Copper Vacancies in Optical Float Zone Refined Cuprous Oxide N. LASZLO FRAZER, KELVIN CHANG, KENNETH POEPPELMEIER, JOHN KETTERSON, Northwestern University — Cuprous oxide (Cu_2O) is ideal for studying Wannier-Mott excitons which have anomalously long lifetimes in this material. However copper vacancies have a deleterious effect on the exciton lifetimes. We have measured the associated luminescence spectra in optically excited single crystals. These crystals were prepared in a radiantly-heated float-zone refiner from thermally oxidized copper rod of purity 0.999. The behavior of the vacancy luminescence can be related to exciton propagation.

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