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Mid-infrared Emission and Energy Transfer Properties of Sensitized Nd^{3+} Ions in Low Phonon-Energy Hosts ALTHEA BLUIETT, NATASHA JACOBITZ, NATASHA STOKES, Elizabeth City State University, EIEI BROWN, UWE HOMMERICH, Hampton University, SUDHIR TRIVEDI, Brimrose Corporation of America, JOHN ZAVADA, North Carolina State University — Mid-infrared emission (4-6 μm) stemming from the first excited state of Nd^{3+} can be generated in KPb_2Cl_5 by pumping its $^4F_{5/2}$ absorption band at ∼800 nm. It has been proposed that 4-6 μm emission of Nd^{3+} could be enhanced by directly pumping the $^4I_{15/2}$ absorption band centered at ∼1650 nm. This pumping scheme could initiate a 3-for-1 cross relaxation, which ultimately increases the population in the first excited state of Nd^{3+}. Unfortunately, the $^4I_{15/2}$ absorption band of Nd^{3+} is weak and diode laser pumping of this level is not practical. To more efficiently populate the $^4I_{15/2}$ level in Nd: KPb_2Cl_5, Tm sensitization of Nd^{3+} via ∼1700 nm excitation is under exploration. Experimental results show that the Tm♢Nd energy transfer was successful with energy transfer efficiencies ranging from 46% - 98%. The energy transfer was followed by strong 4-6 μm emission from co-doped Tm, Nd: KPb_2Cl_5 samples. Preliminary results on Tm, Nd: KPb_2Br_5 will also be discussed.

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