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A photoluminesence (PL) study of the radiative recombination mechanisms for CdTe films deposited under different Cd and Te overpressure by elemental vapor transport is presented. The experiment and analysis have been carried out in the temperature range of 12–130 K. The intensity of the PL laser excitation beam was varied by two orders of magnitude. It has been established that the bands in the 1.47–1.50 eV are determined by transitions involving shallow D and A states and the 1.36x–1.37x eV band is due to band to level transitions. Deep transitions at 1.042 eV and 1.129 eV are due to radiative transitions to levels determined by CdTe native defects.