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Low-temperature time-resolved photoluminescence characterization of 3,4,9,10-perylene tetracarboxylic dianhydride crystals

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In the present work, we investigate the recombination dynamics in α-PTCDA (perylene tetracarboxylic dianhydride) crystals with time-resolved photoluminescence (PL) techniques. From a data analysis based on three different recombination channels, we assign two decay times of τ_s=(33.5±2) ns and τ_m=(12.7±0.4) ns to radiative decay, while a faster component of τ_f=(3±1) ns is likely to have strong nonradiative contributions. Our findings are compared to recent investigations of the dispersion of Frenkel excitons and calculated radiative recombination rates for PL out of the minimum of the Frenkel exciton dispersion.

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