

Influence of the excitation light intensity on the rate of fluorescence quenching reactions: pulse experiments

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The effect of multiple light excitation events on bimolecular photo-induced electron transfer reactions in liquid solution is studied experimentally. It is found that the decay of fluorescence can be up to 25% faster if a second photon is absorbed after a first cycle of quenching and recombination. The dependency on the delay between the pulses and their power, the viscosity of the medium and free energy of the quenching and recombination reactions are discussed in detail. The observed experimental results are in qualitative agreement with the theoretical predictions (see Fig. 1).^[1,2]

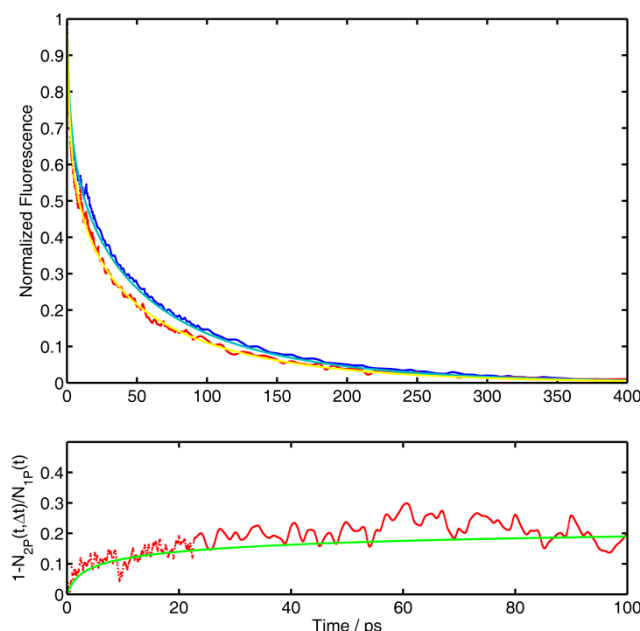


Figure 1. Upper panel: R6G fluorescence decay in presence of 0.4 M TMPPD in ACN kinetics after one (blue) and two pulses (red). Simulation curves for the kinetics after each of the pulses (first: cyan, second: yellow). Lower panel: Relative effect from the experimental data in red and from the simulations in green. The delay between pulses was 60 ps and the excitation power 1.3 mW.

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