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Poster: Controlling Excimer Formation Through Strong Coupling

Rapid and efficient energy migration necessitates minimization of trap state formation during excited state processes, such as excimer in organic photovoltaic devices [1]. In this direction, we show that the strong coupling of matter with quantum light can provide the handle to regulate the excimer formation dynamics. Our static fluorescence investigation demonstrates that electronic strong coupling can provide an alternative pathway to channel the radiative emission through the polaritonic state and hinder the excimer formation by tuning the ladder of molecular energy levels without perturbing the excimer state energy level. Interestingly, their ultrafast decay kinetics reveal the enhancement in the excited state deactivation rate and reduction of the excimer lifetime under the strong coupling regime. The interaction between quantum light and matter selectively facilitates efficient energy migration by reducing excimer formation in a strong coupling regime and enhancing excimer emission under weak coupling scenarios.

References:

[1] Morishima, Y.; Tominaga, Y.; Nomura, S.; Kamachi, M. Fluorescence and Energy Migration in the Random Copolymers of (1-Naphthylmethy) methacrylamide and Sodium 2-(Acrylamido)-2-methylpropanesulfonate. Macromolecules. 1992, 25, 861-866.

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