Unravelling the wavelength dependency of anthracene photoinitiated reactions

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Reversible photoinitiated reactions are of great interest in a variety of research fields including additive manufacturing and single chain folding. These reactions allow to exert control over the reaction in space and time [1], therefore understanding the effect of the conditions on the forward and reverce photochemical reactions is of the utmoust interest.
Herein, a general kinetic model is developed for the [4+4] wavelength dependent photocycloaddition of anthracene in solution [2,3], identifying, for the first time, wavelength dependent kinetic parameters on the elementary reaction level, considering a univerisal protocol. Between 260 and 330 nm anthracene and its photodimer competitive absorptions are predicted, permitting the finetuning of the period and the wavelength of the irradiation to control the outcome of the photoreaction [3]. The platform is also extended to vizualize single chain folding folding upon incorporation of anthrancenes into polymer chains.

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