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Photoblinking and photobleaching of single Rhodamine 6G molecules.

Thursday, 28 June 2018 15:00 (2 hours)

Single molecule resolved fluorescence microscopy used in this work relies on a combination of high detection sensitivity and localization with nanometer precision. The detection of individual molecules in single molecule experiments reveals rare events such as photoblinking and photobleaching, which allows accessing of properties that are otherwise hidden in ensemble measurements [1].The photophysical properties of single rhodamine 6G molecules embedded in thin polymer films were studied, from which the photoblinking and photobleaching behavior was identified. Photoblinking is the reversible decrease of the emission of the fluorescent dye molecules whilst photobleaching is an irreversible process caused by light-induced chemical reactions which transform the fluorophore into a molecule that does not fluoresce [2]. By analyzing the duration and distribution of the on and off times (photoblinking), the lifetime and population efficiency of the dark states of the rhodamine 6G molecules was obtained which provide specific information of the embedding medium.

[1]. Dominik Woll et al, “Polymers and single molecule fluorescence microscopy,what can we learn?”,Chem.Soc.Rev,vol 38,pp313-328, 2009.
[2]. T. Gensch et al, “Single Molecule Blinking and Photobleaching Separated by Widefield Fluorescence Microscopy,” Journal of Physical Chemistry, vol. 109, no. 30, pp. 6652-6658, 2005.

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