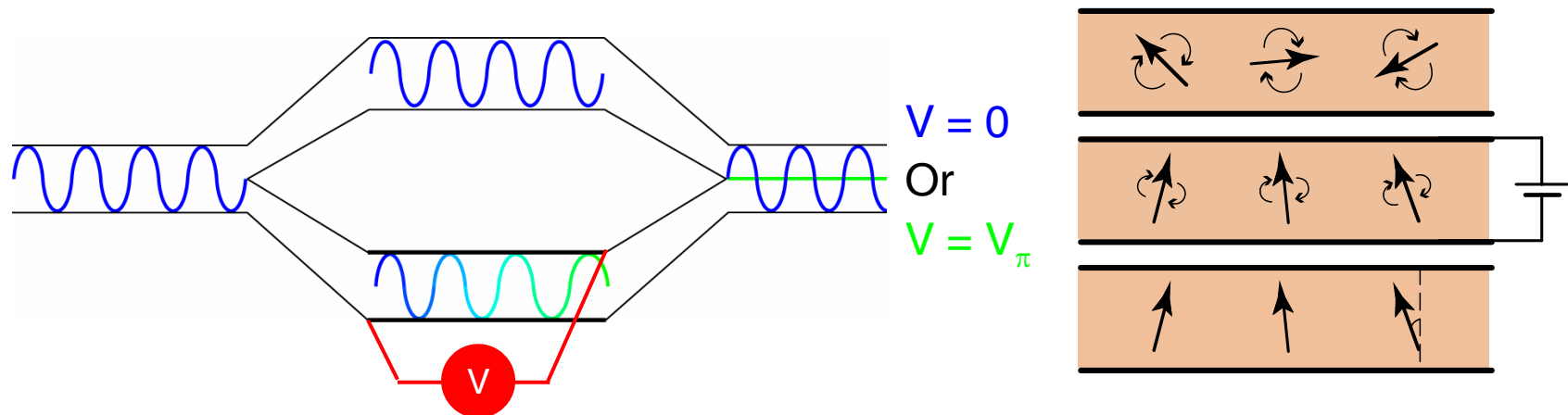


Single Molecule Rotation Studies

Dan Sluss
Chemistry
March 6, 2007

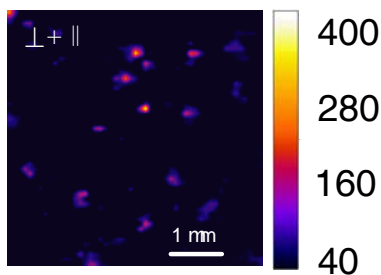
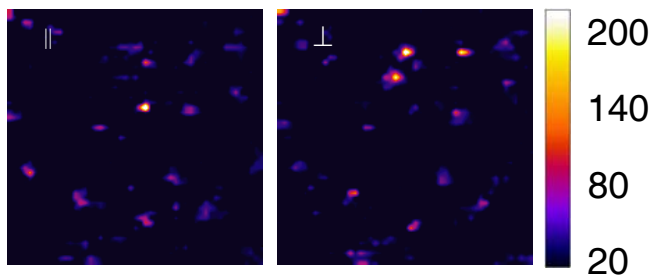
Exploring the rotational dynamics of single molecules in a host polymer matrix using polarization sensitive fluorescence confocal microscopy.



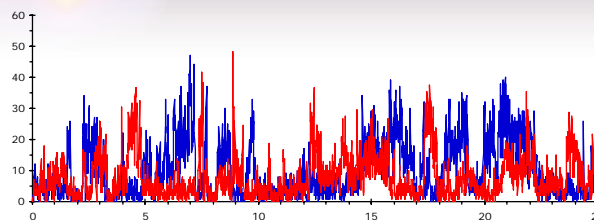
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WASHINGTON

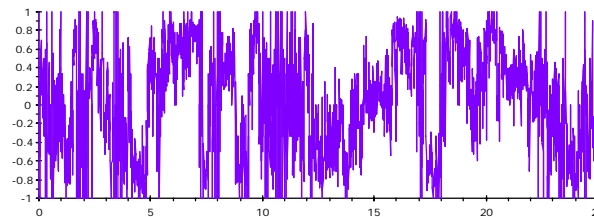
Single Molecule Rotation Studies



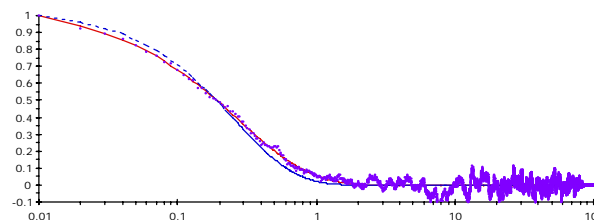
All counts per 100 ms



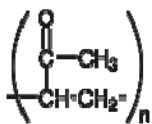
$$A_i(t) = \frac{I_{\parallel}(t) - I_{\perp}(t)}{I_{\parallel}(t) + I_{\perp}(t)}$$



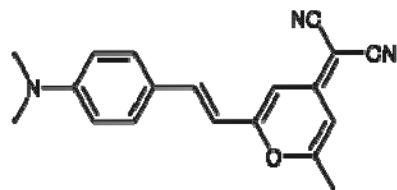
$$C(t) = \frac{\sum_{t=0}^T A(0)A(0+t)}{|A(0)|^2}$$



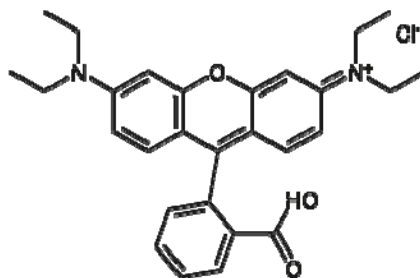
$$C(t) = \exp\left[-(t/\tau_{\text{KWW}})^\beta\right]$$



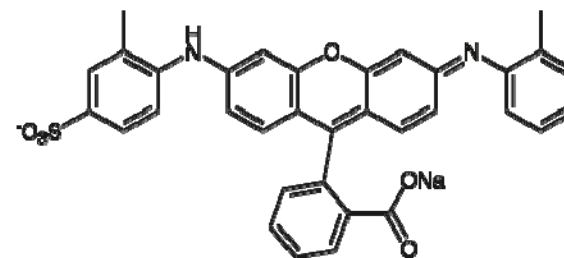
PMA



DCM



RHB



VR

Single Molecule Rotation Studies

	n	$\langle \beta \rangle$	$\langle \tau_{\text{KWW}} \rangle$ (s)	$\langle \text{Ratio} \rangle$
DCM	108	0.84 ± 0.01	0.22 ± 0.01	0.97 ± 0.01
DCM in 50 V/μm field	77	0.85 ± 0.01	0.23 ± 0.02	0.97 ± 0.02
RhB	119	0.82 ± 0.01	0.36 ± 0.02	
RhB in Nitrogen gas	99	0.83 ± 0.01	0.52 ± 0.03	
VR	112	0.81 ± 0.01	0.19 ± 0.03	