



**Fig.SI-1.**(I) Normalized SECM feedback approach curves for the approach of a Pt disk UME towards NiO film in the dark (curve #0) and under illumination with red LED in different dyes in electrolyte 1mM I<sup>-</sup>+0.1M LiTFS. Photon flux density of LED in  $10^{-9} \text{ mol cm}^{-2} \text{ s}^{-1}$  (1) 2.2, (2) 4.19, (3) 6.82 (4) 9.41, (5) 12.1, (6) 13.1 (7) 14.7;  $v_T = 0.05 \text{ Vs}^{-1}$ ,  $E_T = 0.7 \text{ V}$ ,  $[I^-] \text{ k}$ : (a) P1 dye (1) 0.052, (2) 0.081, (3) 0.086, (4) 0.109 (5) 0.11 (6) 0.12 (7) 0.13 and corresponding  $k_{\text{eff}} \times 10^{-3} \text{ cms}^{-1}$  (1) 2.87 (2) 5.61 (3) 5.93, (4) 7.56 (5) 8.01 (6) 8.91 (7) 9.19 (b) C343 dye (1) 0.018 (2) 0.036, (3) 0.038 (4) 0.049 (5) 0.052 (6) 0.057 (7) 0.059 and corresponding  $k_{\text{eff}} \times 10^{-3} \text{ cms}^{-1}$  (1) 1.28, (2) 2.51, (3) 2.66 (4) 3.39 (5) 3.59 (6) 3.99 (7) 4.12