

A Formation Model of Superoxide Radical Photogenerated in Nano-TiO₂ Suspensions

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Chemicals and instrumentation

The anatase TiO₂ and 5-amino-2,3-dihydro-1,4-phthalazine-dione (luminol) were purchased from Sigma-Aldrich (St. Louis, MO, USA). The CFCL apparatus for monitoring the formation process of O₂^{•-} was custom-built in house and has been previously described in details.¹ In summary, the CFCL apparatus is primarily comprised of a photo reactor, a computer-controlled CL analyzer (Institute of Biophysics, Chinese Academy of Sciences, Beijing, China), and two peristaltic pumps (Longer Precision Pump Co., Baoding, Hebei, China). The photo reactor is a cylindrical quartz container (200 mL) irradiated with a 500 W xenon light source (Trusttech Co., Beijing, China) using a 365 nm filter. The light wavelength used was 365±9 nm. Glass containers were connected to the peristaltic pumps using Tygon pump tubing (i.d.:1 mm). Fluids were pumped into a spiral detection cell in the CL analyzer, and the CL intensity was measured with a photomultiplier tube (PMT). The irradiation intensity was measured by the radiometer. The concentration of DO in TiO₂ suspensions was changed by purging oxygen or nitrogen respectively, and measured by the portable dissolved oxygen meter.

Table S1. CL intensity upon different experimental conditions at different irradiation time.

Time (s)	TiO ₂ concentration (mg/mL)			Irradiation intensity (mW/cm ²)			DO concentration (mg/mL)		
	0.02	0.05	0.10	0.3	1.1	2.0	2.0	8.0	32.0
300	1077	1609	2409	2762	3157	3374	5274	7385	12194
600	1426	2329	3813	4009	5042	5692	5331	7449	12368
900	1709	2778	4744	5059	6485	7462	5335	7452	12378
1200	1937	3058	5361	5945	7589	8813	5335	7452	12379
+∞	2905	3524	6575	10703	11187	13171	5335	7452	12379

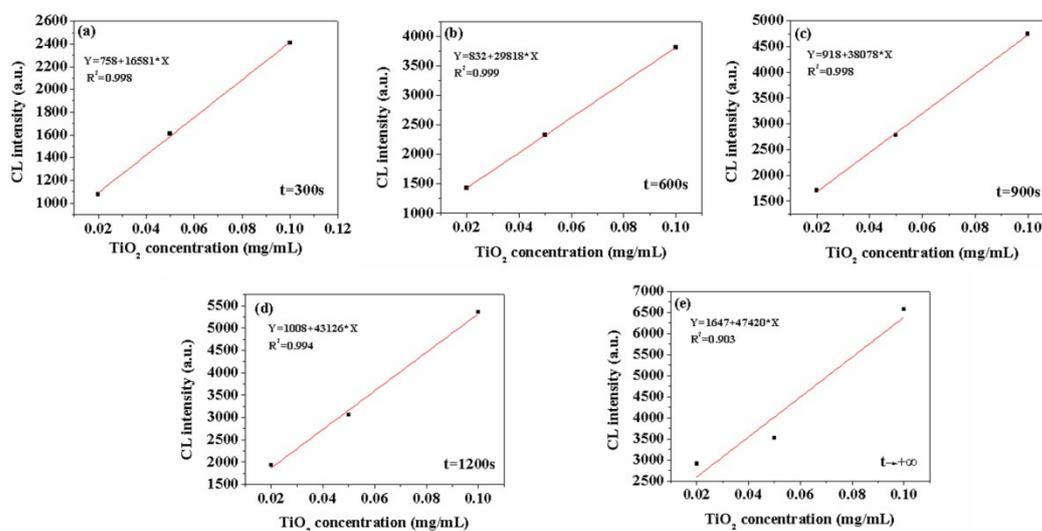


Figure S1. Linear fitting between CL intensity and TiO₂ concentrations at 300s(a), 600s(b),

900s(c), 1200s(d) and $+\infty$ (e).

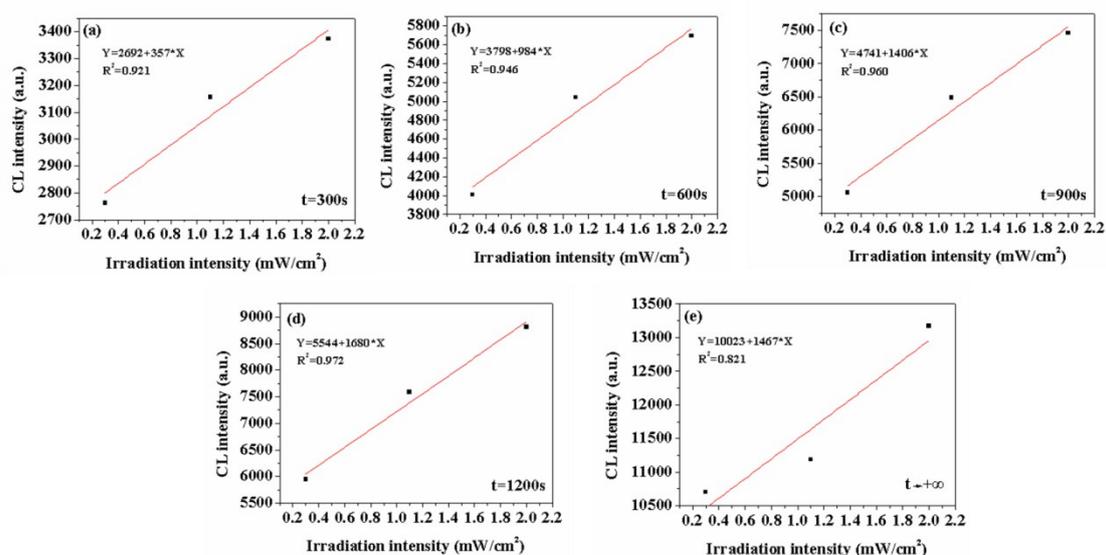


Figure S2. Linear fitting between CL intensity and irradiation intensity at 300s(a), 600s(b), 900s(c), 1200s(d) and $+\infty$ (e).

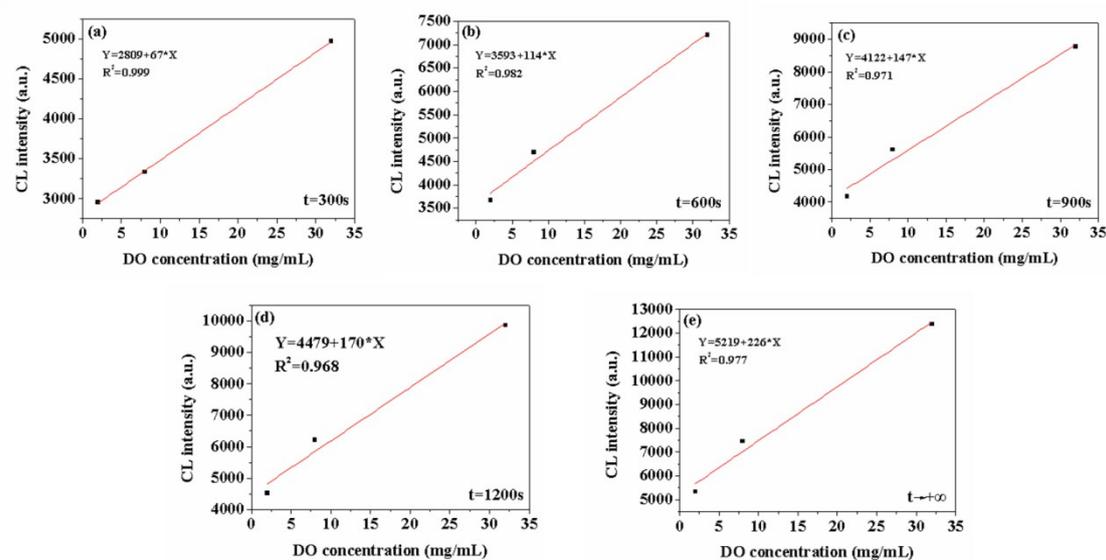


Figure S3. Linear fitting between CL intensity and DO concentration at 300s(a), 600s(b), 900s(c), 1200s(d) and $+\infty$ (e).

Reference

1 D. Wang, L. Zhao, L.-H. Guo, H. Zhang, *Analytical chemistry*, 2014, **86**, 10535-10539.