
Chemiluminescence of peroxyxynitrous acid and its application in flow injection analysis

Jin-Ming Lin*¹

¹Department of Chemistry, Tsinghua University – Beijing 100084, China

Abstract

Chemiluminescence (CL) has advantages, such as high sensitivity and simple instrument because it does not need any extra power. It has been widely used in chemical, biological as well as environmental filed. Fluorescence carbon dots have been synthesized by microwave method using serine as the carbon source. Peroxyxynitrous acid as one of the reactive nitrogen species has high oxidant potential, which is prepared by the mixing of nitrite and hydrogen peroxide in the present study. Peroxyxynitrous acid induced CL has been firstly found and the CL mechanism is illustrated on the base of the CL spectrum, UV-visible spectrum, fluorescence spectrum, electron paramagnetic resonance spectrum and radical scavenger experiment, which gives us new insight into luminescence property of the carbon dots. The CL intensity of the system is dependent on the concentration of nitrite for the preparation of the peroxyxynitrous acid. Based on the principle, a sensitive flow injection CL method has been developed for the nitrite in water and milk samples.

References

- 1) S. N. A. Shah, J.-M. Lin, *Advances in Colloid and Interface Science*, 2017, 241,24–36.
- 2) Z.Lin, X. Dou, H. Li, Y. Ma, J.-M. Lin*, *Talanta*, 2015, 132, 457–462.
- 3) Z. Lin, H. Chen, J.-M. Lin, *Analyst*, 2013, 138, 5182–5193.
- 4) C. Lu, J.-M. Lin, C.W. Huie, M. Yamada M. *Anal. Chim. Acta*, 2004, 510, 29-34.
- 5) C. Lu, J.-M. Lin, *Catal. Today*, 2004, 90, 343-347.
- 6) C. Lu, G. Song, J.-M. Lin, C.W. Huie, *Anal. Chim. Acta*, 2007, 590, 159-165.
- 7) Z. Lin, W. Xue, H. Chen, J.-M. Lin, *Anal. Chem.*, 2011, 83: 8245–8251
- 8) Z. Lin, W. Xue, H. Chen, J.-M. Lin, *Chem. Commun.*, 2012, 48, 1051-1053

Keywords: peroxyxynitrous acid, chemiluminescence, flow injection analysis, nitrite

*Speaker