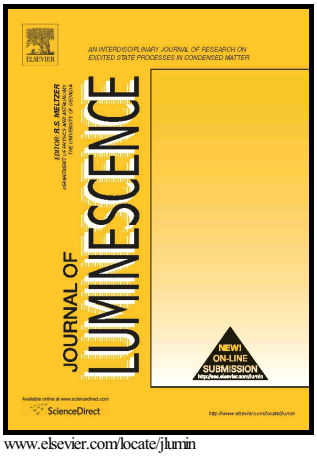
Hydrazone as a new fluorophore in the peroxyoxalate chemiluminescence reaction

Leilian Cristine de Paula Oliveira, Ivanise Gaubeur, Patrícia Dantoni



www.elsevier.com/locate/jlumin

PII: S0022-2313(16)31003-1
DOI: http://dx.doi.org/10.1016/j.jlumin.2016.11.072
Reference: LUMIN14410

To appear in: *Journal of Luminescence*

Received date: 29 July 2016
Revised date: 24 November 2016
Accepted date: 25 November 2016

Cite this article as: Leilian Cristine de Paula Oliveira, Ivanise Gaubeur and Patrícia Dantoni, Hydrazone as a new fluorophore in the peroxyoxalate chemiluminescence reaction, *Journal of Luminescence* http://dx.doi.org/10.1016/j.jlumin.2016.11.072

Hydrazone as a new fluorophore in the peroxyoxalate chemiluminescence reaction

Leilian Cristine de Paula Oliveira, Ivanise Gaubeur, Patrícia Dantoni*

Centro de Ciências Naturais e Humanas, Universidade Federal do ABC - UFABC,

Avenida dos Estados, 5001, Bloco B, 09210-580, Santo André, São Paulo, Brazil

*Corresponding author. Tel.: +55 11 4996 0159. patricia.dantoni@ufabc.edu.br (P. Dantoni)

Abstract

Peroxyoxalate chemiluminescence reactions involve the oxidation of oxalate ester by hydrogen peroxide (H_2O_2), forming intermediates capable of exciting fluorophores. These intermediates are known for their high sensitivity, quantum yield of chemiluminescence and wide linear range for analyte detection. This study aims at the application of complexing agents di-2-pyridyl ketone benzoylhydrazone and di-2-pyridyl ketone salicyloylhydrazone, or these agents complexed with Pb(II) as fluorophores, as well as use of these reactions for metal determination. Both complexing agents have fluorescent properties, however only the former could be applied. The buffering system used was HCO_3^-/CO_3^{-2}, pH 10.3 and the ester 2,4,6-triclorophenyl oxalate, prepared in 1,2-dimethoxyethane. The addition of Pb(II) to the peroxyoxalate chemiluminescence reaction makes the signal decrease by 36%. Through the Stern-Volmer equation, it was possible to determine the ion within a range from 2.07 to 41.4 mg L^{-1}(R^2 0.9894), with detection and quantification limits of 0.45 mg L^{-1} and 1.5 mg L^{-1}, respectively.

1. Introduction