

Accepted Manuscript

Research paper

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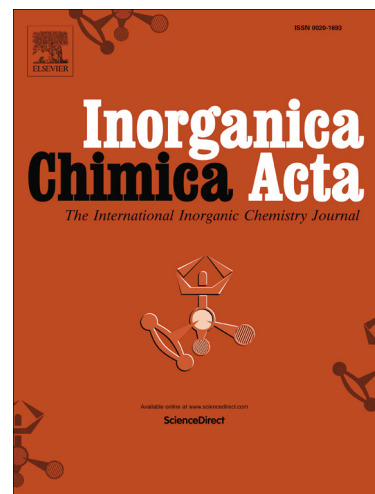
PII: S0020-1693(16)30896-9
DOI: <http://dx.doi.org/10.1016/j.ica.2016.12.025>
Reference: ICA 17387

To appear in: *Inorganica Chimica Acta*

Received Date: 16 November 2016
Revised Date: 19 December 2016
Accepted Date: 20 December 2016

Please cite this article as: O.L. Osifeko, T. Nyokong, Effects of symmetry and the number of positive charges on the photocatalytic activity of indium phthalocyanines when embedded in electrospun fibers, *Inorganica Chimica Acta* (2016), doi: <http://dx.doi.org/10.1016/j.ica.2016.12.025>

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Effects of symmetry and the number of positive charges on the photocatalytic activity of indium phthalocyanines when embedded in electrospun fibers

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Abstract:

Photooxidations of bisphenol A and 4-chlorophenol were carried out in this study using two asymmetric indium(III) phthalocyanines photosensitizers: the first consisting of one quaternized 4-pyridyloxyl and no other substituents (complex **1**) and the second containing three quaternized 4-pyridylsulfanyl units and one aminophenoxy (complex **3**). The asymmetry of complex **3** is additionally caused by the presence of two linking atoms (O and S). The symmetrically substituted Indium(III) phthalocyanine containing four quaternized 4-pyridyloxyl units (complex **2**) was also studied. The complexes were embedded in electrospun polystyrene fiber for heterogeneous photocatalytic transformation of 4-chlorophenol and bisphenol A. When immobilized on electrospun fibers, complexes **1**, **2** and **3** gave singlet oxygen values of 0.31, 0.39 and 0.50 in water, respectively. Complex **3** showed the best photocatalytic behavior with observed rate constants of $2.8 \times 10^{-3} \text{ min}^{-1}$ for bisphenol A and $3.8 \times 10^{-3} \text{ min}^{-1}$ for 4-chlorophenol.

Keywords: Singlet Oxygen Quantum Yield, Photo-oxidation, electrospinning, indium phthalocyanine.

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