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Cationic dipyridylamine substituted zinc tetrapyrazinoporphyrazine derivatives for photodynamic therapy

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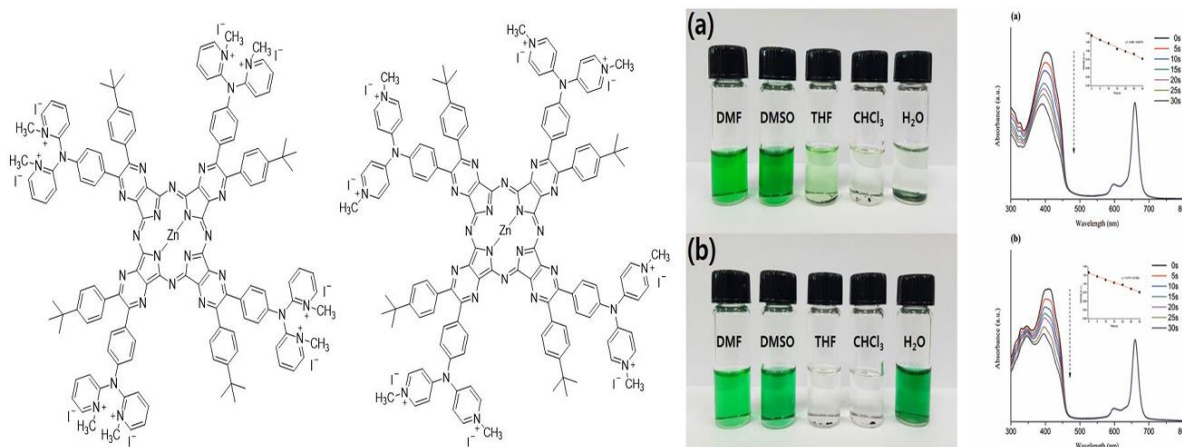
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Graphical Abstract



Highlights

- Cationic zinc tetrapyrazinoporphyrazine derivatives substituted with *ortho*- or *para*-methylpyridinium groups on the peripheral position have been synthesized.
- Cationic zinc tetrapyrazinoporphyrazine substituted with *para*-methylpyridinium groups were soluble in aqueous solution.
- Both of compounds showed appropriate fluorescence and singlet oxygen quantum yield.

Abstract

Two kinds of cationic zinc tetrapyrazinoporphyrazine derivatives substituted with *ortho*- or *para*-methylpyridinium groups on the peripheral position were synthesized and characterized. The solubility and aggregation behavior of each material were estimated in various solvents, which show different aspect depending on the position of nitrogen on methylpyridinium groups. The fluorescence quantum yield (Φ) values of both cationic tetrapyrazinoporphyrazines were measured and the singlet oxygen quantum (Φ) yield value were measured by indirect method with DPBF (1,3-diphenylisobenzofuran) in DMSO. Both Φ and Φ of cationic zinc tetrapyrazinoporphyrazine derivatives exhibited reasonable values for photodynamic therapy application. The cationic zinc tetrapyrazinoporphyrazine derivatives substituted methylpyridinium groups increased solubility in aqueous solvent but also showed the suitable properties as the photosensitizers for photodynamic therapy.

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