IOCPC 2026 Conference

MDPI

Pyrazinoporphyrins for the photooxidation of organic sulfides: the role of the metal center and functional groups

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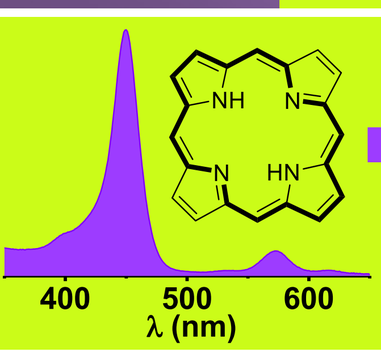
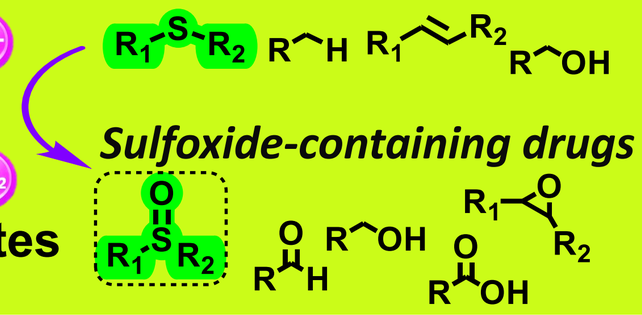
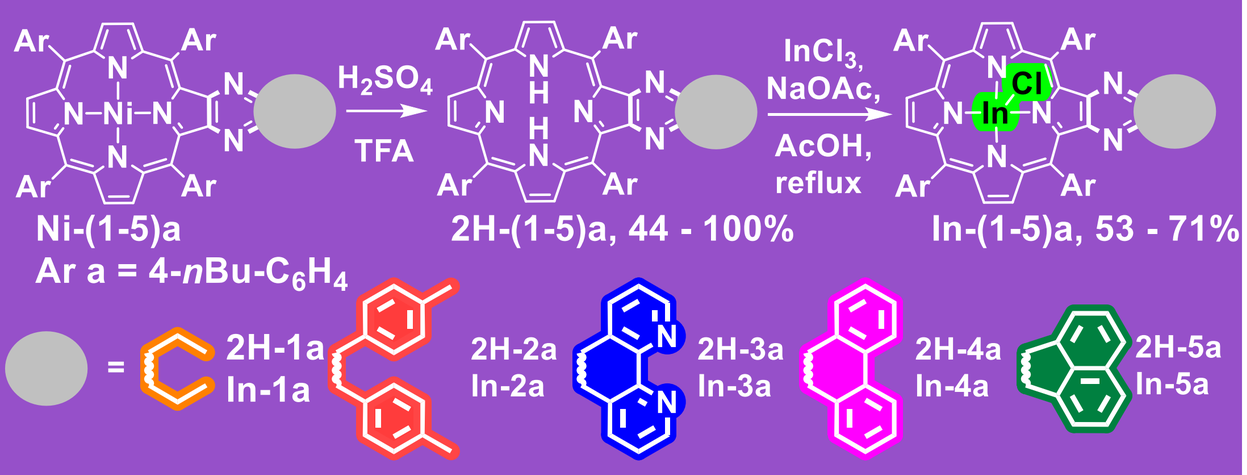


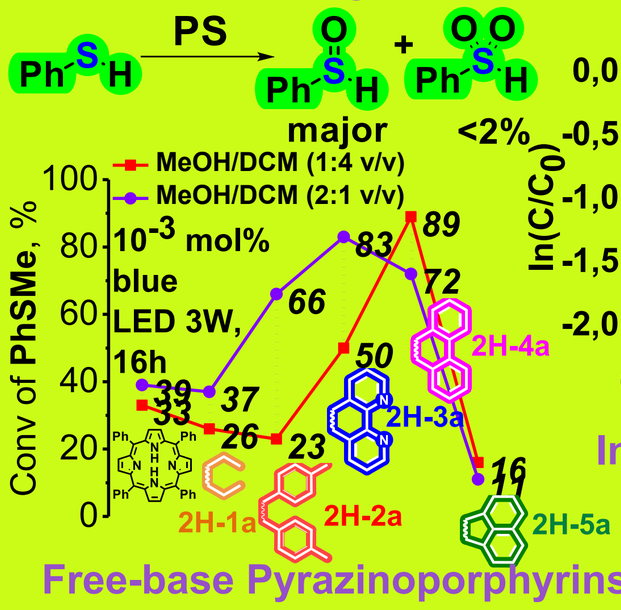
Mild Photooxidation of Organic Substrates



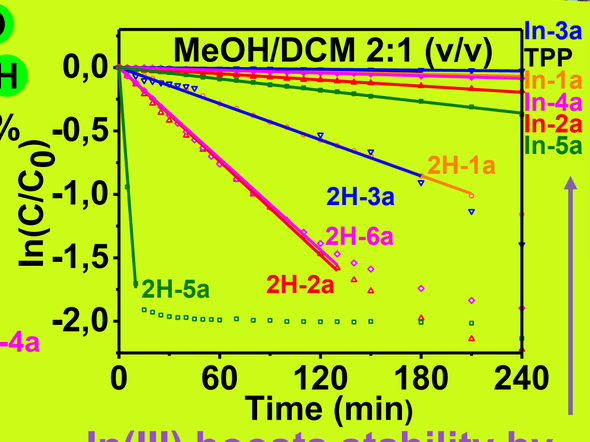
Photoactive π-expanded pyrazinoporphyrins



Photoactivity



Photostability



In(III) boosts stability by up to 100x

3D-Printed 12-Position Photoreactor

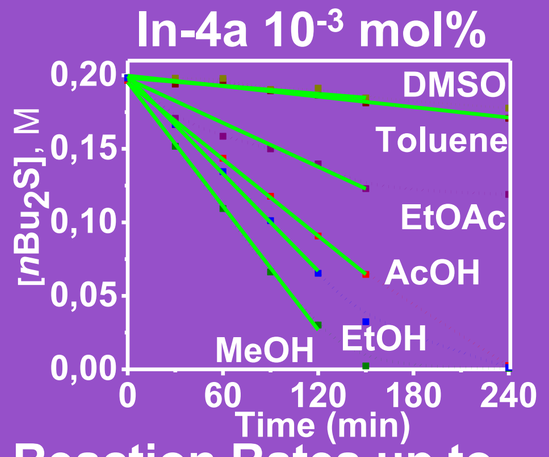
3W blue LED

3 Parallel Experiments

Free-base Pyrazinoporphyrins outperform TPP Despite Lower Photostability

• Fast Oxidation in Sustainable Media

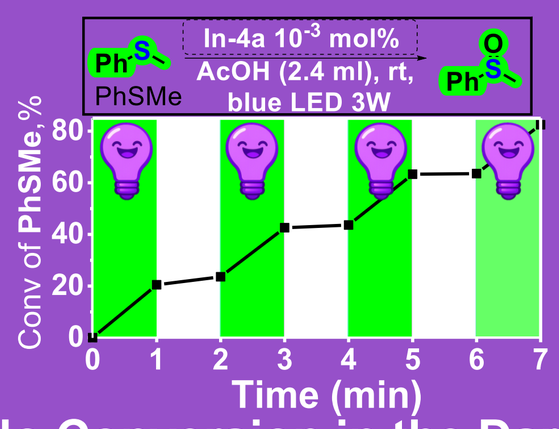
In-4a 10^{-3} mol%



Reaction Rates up to $1.4 \cdot 10^{-3}$ M•min^{-1}

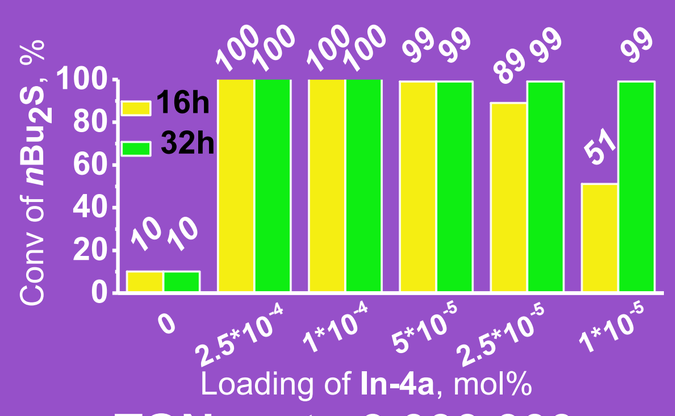
• On-Off experiment

In-4a 10^{-3} mol%, AcOH



No Conversion in the Dark

• PS Loadings down to 10^{-5} mol% in AcOH

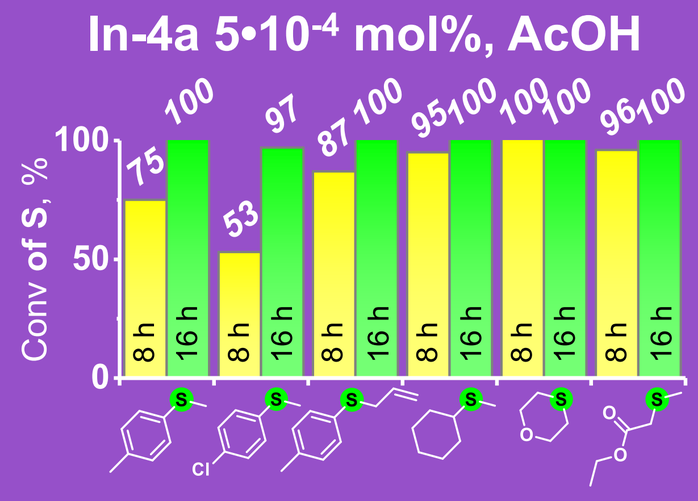


TON up to 9 000 000

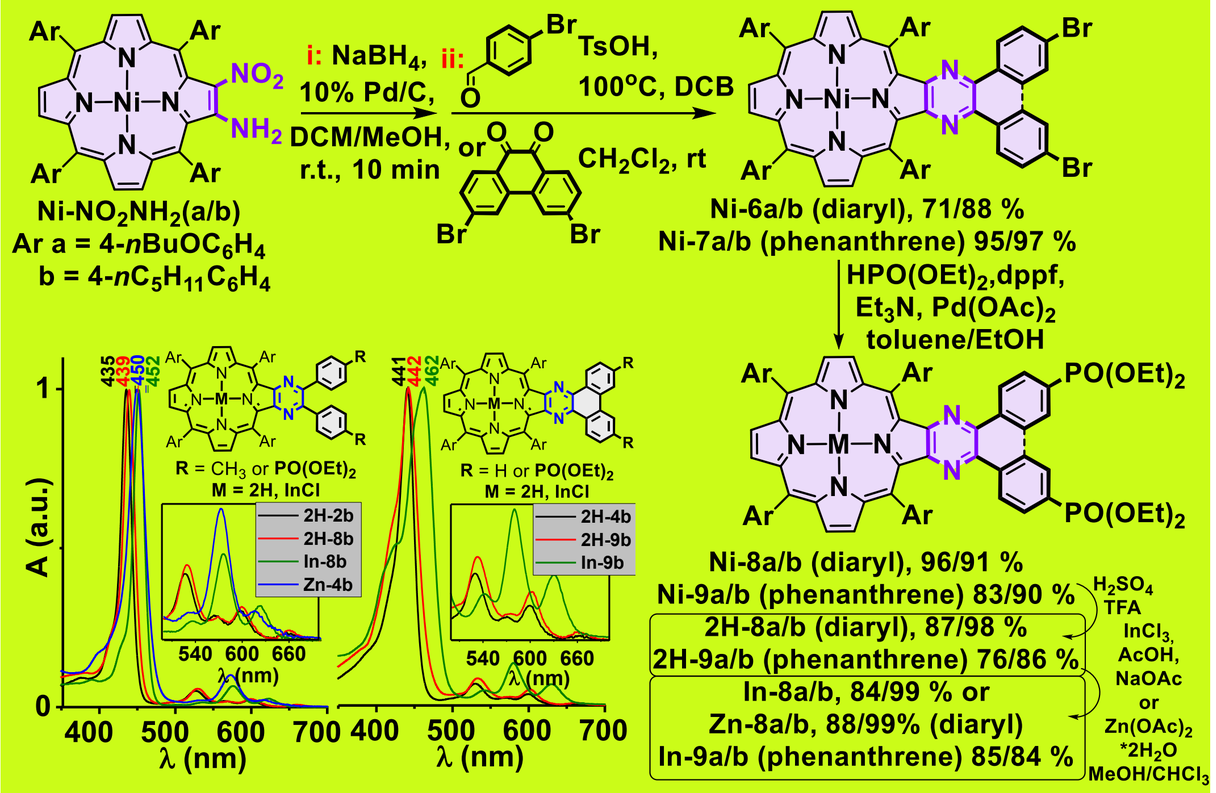
TOF up to 309 000 h^{-1}

•Selective Oxidation of Diverse Sulfides

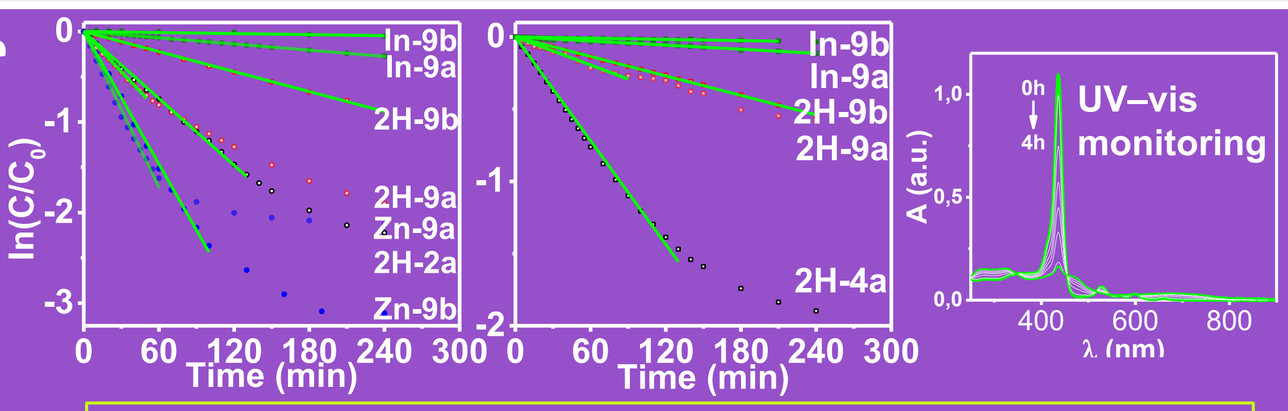
In-4a $5 \cdot 10^{-4}$ mol%, AcOH



Phosphonate-Substituted Pyrazinoporphyrins: Diaryl or Phenanthrene Motifs



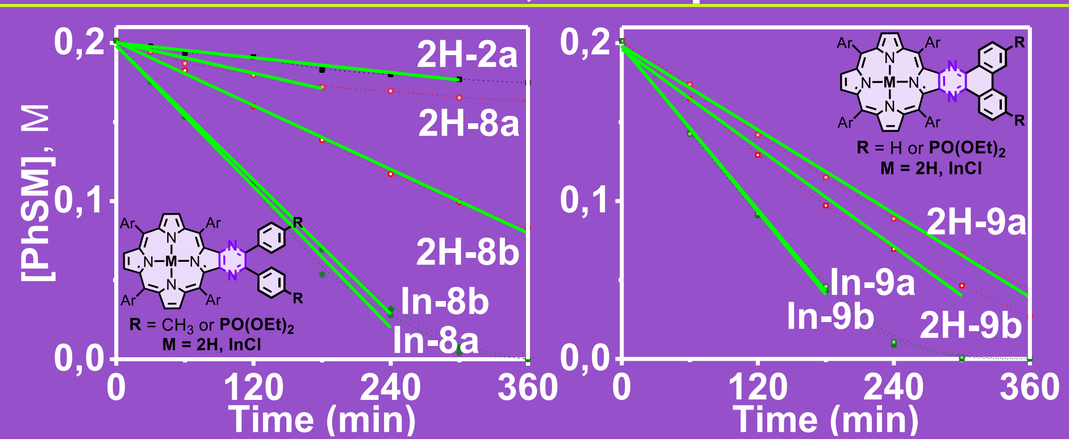
• Photostability



Diethylphosphoryl groups enhance both photostability and photoactivity. Full conversion of thioanisole in 5h, TOF up to 16 700 h^{-1}

• Photoactivity

PS 10^{-3} mol% in AcOH



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E.S. Shremzer et al. Dyes and Pigments 210 (2023) 110935

E.S. Shremzer et al. Journal of Catalysis 450 (2025) 116327

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