

Photosensitized Water Oxidation Using a Bio-Inspired Manganese Catalyst

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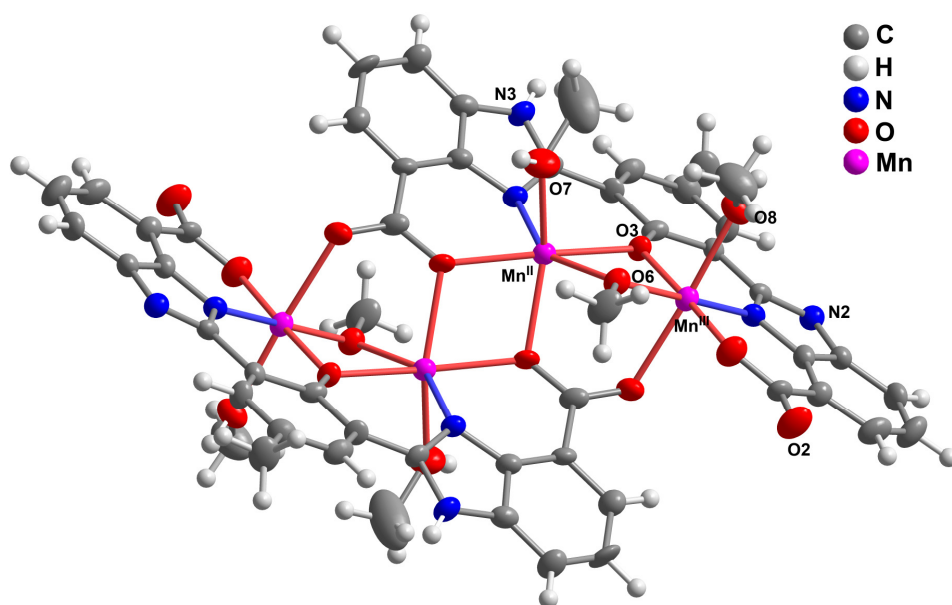
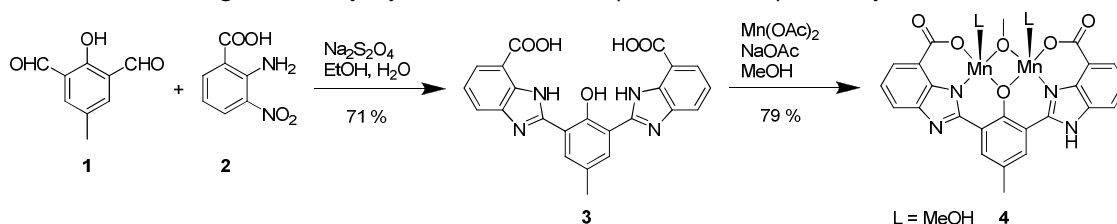


Figure 1. X-ray crystal structure of complex 4 at 50 % probability level.



INTRODUCTION

Water oxidation catalysts are essential in bio-inspired systems for solar-driven water splitting.¹ Several ruthenium catalysts are known,² but so far no manganese-based catalysts have been reported.

RESULTS AND DISCUSSION

Complex 4, prepared in a simple two-step sequence, has a tetranuclear structure, resembling the OEC in photosystem II. Treatment of 4 with Ru(bpy)₃³⁺ as oxidant led to evolution of oxygen with a TON of 25. Furthermore, employing visible light together with Ru(bpy)₂(deeb)²⁺ as photosensitizer and S₂O₈²⁻ as electron acceptor, a TON of 4 was achieved.

CONCLUSION

This is, to the best of our knowledge, the first homogeneous manganese complex to catalyze water oxidation using a one-electron oxidant, and also using visible light and a photosensitizer.

ACKNOWLEDGEMENTS

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