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Title:	Synthesis, structure, polyphenol oxidase mimicking and bactericidal activity of a zinc-schiff base complex
Authors:	Joshi, Mayank (/jspui/browse?type=author&value=Joshi%2C+Mayank) Choudhury, A.R. (/jspui/browse?type=author&value=Choudhury%2C+A.R.)
Keywords:	Zinc(II) 4-Methylcatechol oxidation Bactericidal activity Electrochemical analysis Schiff base X-ray structure
Issue Date:	2020
Publisher:	Elsevier Ltd
Citation:	Polyhedron
Abstract:	<p>Focusing on the important biological functions of metallo-enzymes and metallo-therapeutics in living world, this research work demonstrates the synthesis, crystal structure, supramolecular architecture, 4-methylcatechol oxidation and bactericidal activity of an interesting zinc-Schiff base complex, $[Zn(HL)_2Cl_2]$ (1), [Schiff base (HL) = 2-(2-methoxybenzylideneamino)phenol]. Crystal structure analysis of the zinc-Schiff base reveals that zinc centre exists in a distorted tetrahedral geometry. The Schiff base adopts three donor centres, however it gets protonated to exist in a zwitter ionic form and behaves as a monodentate coordinator in 1. This zinc-Schiff base complex has been examined towards the bio-mimetic oxidation of 4-methylcatechol (4-MC) in methanol and portrays its good efficacy with good turnover number, $1.45 \times 10^3 \text{ h}^{-1}$. Electro-chemical study, electron paramagnetic resonance analysis and electrospray ionization mass spectrometry results for the zinc-Schiff base complex in presence of 4-MC ensures that the catalytic reaction undergoes through enzyme-substrate binding, and generation of radical in the course of catalysis drives the catalytic oxidation of 4-MC. Antibacterial study has also been performed against few clinical pathogens (Bacillus SP, Enterococcus, and E. coli). Scanning electron microscope and EDAX analysis for the pathogen with little dose of zinc complex confirms the destruction of bacterial cell membrane with 1.44% occurrence of zinc in the selected zone of inhibition area. This observation holds a great promise to develop future antibacterial agent.</p>
Description:	Only IISERM authors are available in the record.
URI:	https://www.sciencedirect.com/science/article/pii/S0277538720305908?via%3Dihub (https://www.sciencedirect.com/science/article/pii/S0277538720305908?via%3Dihub) http://hdl.handle.net/123456789/3468 (http://hdl.handle.net/123456789/3468)
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