

## Synthesis of sulfoxides from its corresponding sulfides by Mn-peroxidase

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### Abstract

The past 20 years have seen associate degree explosion in interest within the synthesis and utility of molecules containing a stereogenic sulfur center. A crucial taxonomic (category|taxon) of this category is that the sulfoxides. Though this structural motif is usually pictured in Lewis structures as analogous to a carbonyl moiety, the sulfur atom of the sulfoxide is if truth be told a stereogenic center once. The Oxygen and sulfur don't share a typical p-orbital pi bond which might enforce a tabular conformation, however rather the Oxygen donates lepton density from a lone try into a d-orbital of sulfur. This d- $\pi$  bonding permits the sulphur to assume tetrahedral sp<sup>3</sup> crossing, with a lone try of electrons from sulphur as "place holders" within the fourth quadrant. Sulfoxides are conformationally stable at temperature and thus are separated into pure enantiomers. The barrier to inversion via a bipyramidal intermediate for many sulfoxide compounds is within the vary of 38-41 kcal/mol. Sulfoxides can solely racemize below rather harsh conditions, together with temperatures in more than 200°C, irradiation to induce C-S bond cutting, and radical transfer reagents. Sulfoxides are found during a sort of natural merchandise. They need additionally been utilized as chiral auxiliaries during a variety of reaction categories, and additional recently as chiral ligands. Sulphur is well-suited to the role of associate degree agent for transfer of chirality for many reasons. The faces of a sulfoxide are extremely differentiated because of the massive steric distinction between its substituents, which vary from associate degree lepton lone try to giant radical teams like tert-butyl. Each sulphur and Oxygen has lone pairs of electrons on the market to coordinate to Lewis acidic practicality, usually promoting extremely ordered transition states. Finally, sulphur will promptly kind valence bonds, together with to heteroatoms, and might be cleaved below comparatively gentle conditions. These properties have impressed substantial investigation into the artificial applications of sulfoxides. A various array of techniques for the synthesis of enantiomerically enriched sulfoxides has been developed. These ways usually are 2 categories: chiral auxiliary directed functionalization and chemical process enantio selective oxidations. The bigger accessibility of chiral sulfoxides successively spurs any investigations into their utility. Chiral sulfoxides are in very high demand in nearly each sector of the industry involved with the look and development of recent artificial reagents, drugs, and purposeful materials. The production of chiral sulfoxide is an important part of the chemical industry since they have been used not only as pharmaceuticals and pesticides but also as catalysts or functional materials. The most common method for the preparation of sulfoxide is by the oxidation of their corresponding sulfides. Both the chemical and biological catalysts have been developed for this purpose. Though, the reaction conditions for the preparation of chiral organic sulfoxides. With hope, that some of them will produce the desired sulfoxides in a good enantiomeric excess. The use of enzymes in oxidative conversions is a potentially attractive method for the synthesis of optically active compounds. An enzyme from a new source has been purified to homogeneity using a simple procedure involving concentration by ultra filtration and anion exchange chromatography on diethyl amino ethyl [DEAE] cellulose column. Sodium dodecyl sulphate-polyacrylamide gel electrophoresis [SDS PAGE] analysis of the purified enzyme has shown a single protein band of molecular mass 43.0 k Da which has been confirmed by native-page. The enzyme transformed approximately 90% methyl phenyl sulfide to its sulfoxide. The product was racemic mixture. The source of the enzyme is conveniently available and the enzyme could be purified using a simpler procedure.

### Biography

Pratibha Yadav has her expertise in Enzymology and organic synthesis. She has joined IIT Delhi, New Delhi, India in May 2014. She has synthesized different sulfoxides and epoxides by plant enzyme. She is working on structural and functional studies of plant enzymes in IIT Delhi. Uses of enzymes in organic synthesis as reagents are preferred. Because it is eco-friendly and optically pure isomers are obtained which are pharmaceutically important. She has isolated, purified and characterized four different peroxidases (were identified as Chloroperoxidase, Mn-Peroxidase, Ascorbate peroxidase and Lignin peroxidase) and one other enzyme Laccase. She has patent on Chloroperoxidase enzyme. Lignin peroxidase is also isolated, characterized and purified from fungal strains Gloeophyllum seperi MTCC-1170 and Loweporous lividus MTCC -1178. Recently, she got IJRULA "Research Peace Award" selected as "International Best Researcher Award of the Year" 2019. 2nd International Scientist Awards "Women Researcher Award 2019" on Engineering, Science and Medicine, 2019 by VD GOOD and 3rd International Best Scientist Awards "Best Scientist Awards", 2020.



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