

PEROXIDASE CATALYTIC CYCLE OF MCM-41-ENTRAPPED MICROPEROXIDASE-11 AS A MECHANISM FOR PHENOL OXIDATION

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Microperoxidases (MP) are cytochrome *c* tryptic products used for the study of peroxidase mechanism because these heme peptides form the same enzyme intermediate. This work shows that the association of Fe(III)MP-11 with MCM-41 (MP11MCM41) results in a catalyst that exhibits peroxidase and monooxygenase properties. In MCM-41, MP-11 UV-visible spectrum exhibits Soret band at 406 nm compatible with the heme group in a hydrophobic microenvironment. The elemental analysis of MP11MCM41 indicated H/C and N/C ratios close to that of MP-11. Hydrogen peroxide but not *tert*-butylhydroperoxide added to the medium, converted Fe(III)MP11MCM41 to Compound II, a high valence oxidized intermediate of the heme peptide, that exhibited the Soret band at 413 nm. In the presence of phenol, at pH 7.0, 7.5 and 8.0, Compound II regenerated the native oxidation state of the enzyme but with spectral alterations in the N- band. In the spectral region of phenol absorption (250 – 300 nm) it was observed changes suggestive of phenol oxidation that was confirmed by mass spectrometry (LCMS). Supported by: FAPESP, CNPq, FAEP-UMC, Secretaria Educação-SP