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Coordination chemistry of manganese and iron with N,O-donor ligands: oxidation catalysis and magnetochemistry of clusters

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List of commonly used Symbols and Abbreviations in This Thesis

ε	molar extinction coefficient ($\text{M}^{-1} \text{ cm}^{-1}$)
λ	wavelength
ν	scan rate
μ_{eff}	effective magnetic moment
μ_{B}	Bohr magneton
a_{Mn}	hyperfine splitting parameter
Δ	height of the activation energy barrier
τ	the relaxation time of the magnetization
AC	Alternating current
DC	Direct current
BLM	bleomycin
bpy	2,2'-bipyridine
bpmen	<i>N,N'</i> -bis(2-pyridylmethyl)- <i>N,N'</i> -dimethyl-1,2-diaminoethane
H ₂ bppa	bis(6-pivalamide-2-pyridylmethyl)-2-pyridylmethylamine
<i>m</i> -CPBA	<i>m</i> -chloroperbenzoic acid
CV	cyclic voltammetry
ΔE	peak-to-peak separation. ($ E_{\text{pa}} - E_{\text{pc}} $)
$E_{1/2}$	half wave potential. ($\frac{E_{\text{pa}} + E_{\text{pc}}}{2}$)
E_{pa}	anodic peak potential
E_{pc}	cathodic peak potential
ee	percentage enantiomeric excess defined as $100 \times (F_{(+)} - F_{(-)}) $, where F is weight or mole fraction, where $(F_{(+)} + F_{(-)}) = 1$.
EPR	electron paramagnetic resonance
ESI-MS	electrospray mass spectrometry
g	spectroscopic splitting factor. (Lande' factor)
GC	gas chromatography
GC-MS	gas chromatography-mass spectrometry
Hacac	2,4-pentanedione
bpia	bis(pyridylmethyl)(N-methylimidazol-2-ylmethyl)amine
benzimpn	<i>N,N,N',N'</i> -tetrakis(2-methylenebenzamidazolyl)-1,3-diaminopropan-2-ol
H ₂ Cl ₈ tdcpp	5,10,15,20-tetrakis(2,6-dichlorophenyl)- β -octachloroporphyrin
H ₂ dfft	Desferri-ferrithiocin
HEtsalim	Ethyl salicylimidate
HMesalim	Methyl salicylimidate
Hphox	2-(2'-hydroxyphenyl)-oxazoline
HphoxCOOMe	Methyl 2-(2'-hydroxyphenyl)-oxazoline-4-carboxylate
HphoxCOOH	2-(2'-hydroxyphenyl)-oxazoline-4-carboxylic acid
HphoxiPr	2-(2'-hydroxyphenyl)-4-isopropylloxazoline

H-3',5'-dClphox	2-(3',5'-dichloro-2'-hydroxyphenyl)-oxazoline
H-3'-HOphox	2-(2',3'-dihydroxyphenyl)-oxazoline
H-3'-Mephox	2-(2'-hydroxy-3'-methylphenyl)-oxazoline
H-5'-Mephox	2-(2'-hydroxy-5'-methylphenyl)-oxazoline
H-5'-MeOphox	2-(2'-hydroxy-5'-methoxyphenyl)-oxazoline
H-5'-NO ₂ phox	2-(2'-hydroxy-5'-nitrophenyl)-oxazoline
H ₂ salen	<i>N,N'</i> -bis(salicylidene)-1,2-diaminoethane (and derived (chiral) ligands)
H ₂ salpn	<i>N,N'</i> -bis(salicylidene)-1,3-diaminopropane
H ₂ (2-OH)-salpn	<i>N,N'</i> -bis(salicylidene)-(2-hydroxy)-1,3-diaminopropane
H ₂ phpz	3(5)-methyl-5(3)-(2-hydroxyphenyl)pyrazole
<i>i</i> _{pa}	anodic peak current
<i>i</i> _{pc}	cathodic peak current
IR	infrared
<i>I</i>	Intensity of peaks
LMCT	ligand-to-metal charge transfer
<i>m/z</i>	mass to charge ratio
Me ₃ tacn	1,4,7-trimethyl-1,4,7-triazacyclononane (and derived ligands)
mcp	<i>N,N'</i> -dimethyl- <i>N,N'</i> -bis(2-pyridylmethyl)-1 <i>R</i> ,2 <i>R</i> -diaminocyclohexane
MMO	methane monooxygenase
MS	mass spectrometry
NIR	near infrared
N-MeIm	1-methylimidazole
NMR	nuclear magnetic resonance
N ₄ py	<i>N,N</i> -bis(2-pyridylmethyl)- <i>N</i> -bis(2-pyridyl)methylamine
OEC	oxygen evolving centre
P-450	the enzyme P-450 (formerly called Cytochrome P-450)
PSII	photosystem II
SMM	Single Molecule Magnet
<i>S</i> _T	Spin Ground state
SOD	Superoxide dismutase
TBHP	<i>t</i> -butyl hydroperoxide
<i>T</i> _B	Blocking temperature
tpa	tris(2-pyridylmethyl)amine
tpaa	tris-[<i>N</i> -(2-pyridylmethyl)-2-aminoethyl]amine
tptn	<i>N,N,N',N'</i> -tetrakis(2-pyridylmethyl)-1,3-diaminopropane
TON	Turnover number of the product (in mole product per mole catalyst)
UV	ultraviolet
Vis	visible