

LIST OF ABBREVIATIONS

AC	alternating current
acac ₂ enH ₂	<i>N,N'</i> -ethylenebis(acetylacetimine)
acacH	pentane-2,4-dione
adaH ₂	<i>N</i> -(2-acetamido)iminodiacetic acid
adipH ₂	adipic acid
alaH	alanine
Am	amyl
5'-AMP	adenosine 5'-monophosphate
ampy	2-(aminomethyl)pyridine
amq	8-aminoquinoline
[9]aneN ₃	1,4,7-triazacyclononane
[15]aneN ₄	1,4,8,12-tetraazacyclopentadecane
[16]aneN ₄	1,5,9,13-tetraazacyclohexadecane
[13]aneS ₄	1,4,7,10-tetrathiacyclotridecane
[14]aneS ₄	1,4,8,11-tetrathiacyclotetradecane
APW	augmented plane wave
argH	arginine
asp	aspartate
ATP	adenosine 5'-triphosphate, disodium salt
au	<i>N'</i> -amidinoisourea
bchd	bicyclo[2.2.1]hepta-2,5-diene; norbornadiene
bg	biguanidine
biimH	2,2'-biimidazole
bipy	2,2'-bipyridine
4,4'-bipy	4,4'-bipyridine
bipyam	di(2-pyridyl)amine
biquin	2,2'-biquinoline
bot	benzoxazole-2-thione
b.p.	boiling point
bpdo	2,2'-bipyridine <i>N,N'</i> -dioxide
bpz	2,2'-bipyrazine
BPz ₄	tetrakis(pyrazol-1-yl)borate
bq	1,2-benzoquinone
bqd	benzoquinone dioximate
bta	2,2'-bi-2-thiazoline
Bu	butyl

<i>t</i> Bu	<i>t</i> -butyl (CMe ₃)
Bz	benzyl
bzacH	1-phenylbutane-1,3-dione (benzoylacetone)
bzd	benzidine
bzimidH	benzimidazole
bzo[15]eneS ₄	3,6,10,13-tetrathiabicyclo[13.4.0]nonadec-1,16,18-triene
cath	catechol (1,2-dihydroxybenzene)
CD	circular dichroism
CF	crystal field
chiraphos	2,3-bis(diphenylphosphino)butane
1,3-chxn	<i>cis</i> -1,3-cyclohexanediamine
citH ₃	citric acid
5-Clphen	5-chloro-1,10-phenanthroline
3-CNacacH	3-cyanopentane-2,4-dione
CNDO	complete neglect of differential overlap
cod	cycloocta-1,5-diene
cot	cyclooctatetraene
cotr	cyclooctatriene
cp	η^5 -cyclopentadienyl
CPL	circularly polarized luminescence
cpta	<i>trans</i> -1,2-diaminocyclopentane
CT	charge transfer
CV	cyclic voltammetry
cych	cyclohexyl
cyclam	1,4,8,11-tetraazacyclotetradecane
cyclen	1,4,7,10-tetraazacyclododecane
cyclops	difluoro{3,3'-(trimethylenedinitrilo)bis(2-butanone-oximato))}borate
cysH	cysteine
dac	1,2-diaminocyclohexane
dadn	1,9-diamino-3,7-diazanonane
dadd	1,10-diamino-4,7-diazadecane
dap	2,6-diethanoylpyridine
dba	1,5-diphenylpenta-1,4-diene-3-one (dibenzylideneacetone)
dbp	5-phenyl-5- <i>H</i> -dibenzophosphole
dbpdiop	<i>R,R-trans</i> -4,5-bis(dibenzophospholomethyl-2,2-dimethyl-1,3-dioxolan
dbzmH	1,3-diphenylpropane-1,3-dione (dibenzoylmethane)

DC	direct current
dcpzH ₂	2,5-pyrazine dicarboxylic acid
dea	diethylacetamide
debg	diethylbiguanidine
def	1,1'-diethanoylferrocene
dehpH	di-(2-ethylhexyl)phosphonic acid
deoa	diethanolamine
depe	1,2-bis(diethylphosphino)ethane
dhaqH ₂	1,4-dihydroxyanthraquinone
diars	1,2-phenylenebis(dimethylarsine)
dien	1,4,7-triazaheptane {diethylenetriamine; bis(2-aminoethyl)amine}
dikH	1,3-diketone (β -diketone)
dim	2,3-Me ₂ -[14]-1,3-diene-1,4,8,11-N ₄ {Me ₂ [14]dieneN ₄ }
(+)-diop	(+)-2,3-O-diisopropylidene-2,3-dihydroxy-1,4-bis-(diphenylphosphino)butane
diox	1,4-dioxan
dipicH ₂	pyridine-2,6-dicarboxylic acid
dma	dimethylethanamide
dmbg	dimethylbiguanidine
dmbpdo	3,3'-dimethyl-2,2'-bipyridine <i>N,N'</i> -dioxide
dme	1,2-dimethoxyethane
dmn	<i>N,N'</i> -dimethyl-1,2-diaminoethane
dmf	dimethylmethanamide
dmg	dimethylglyoximate
dmgH ₂	dimethylglyoxime
dmhH	5,5-dimethylhexane-2,4-dione
dmhpH	2,4-dimethyl-6-hydroxypyrimidine
dmpe	1,2-bis(dimethylphosphino)ethane
dmpm	bis(dimethylphosphino)ethane
dmppl	3,4-dimethyl-1-phenylphosphole
dmpz1H	3,5-dimethylpyrazole
dmsO	dimethylsulfoxide
dmu	<i>N,N,N'</i> -dimethylurea
DNA	deoxyribonucleic acid
dpae	1,2-bis(diphenylarsino)ethane
dpam	bis(diphenylarsino)methane
dpaq	8-(diphenylarsino)quinoline
dpen	<i>N,N'</i> -diphenyl-1,2-diaminoethane
dpg	diphenylglyoximate

dpmH	2,2,6,6-tetramethylheptane-3,5-dione (dipivaloylmethane)
dpmp	bis(diphenylphosphinomethyl)phenylphosphine
dppa	2-(diphenylphosphino)anisole
dppb	1,4-bis(diphenylphosphino)butane
dppba	2-(diphenylphosphino)benzaldehyde
dppe	1,2-bis(diphenylphosphino)ethane
dppee	<i>cis</i> -1,2-bis(diphenylphosphino)ethene
dppf	1,1'-bis(diphenylphosphino)ferrocene
dpphe	1,6-bis(diphenylphosphino)hex-3-ene
dppm	bis(diphenylphosphino)methane
dppp	1,3-bis(diphenylphosphino)propane
dppq	8-(diphenylphosphino)quinoline
dpt	bis(3-aminopropyl)amine
DSC	differential scanning calorimetry
DTA	differential thermal analysis
1,2-dta	1,2-dithiane
dtbiH	2,4-dithiobiuret
dtbH	dithiobenzoic acid
dtc	dithiocarbamate
DTGA	differential thermogravimetric analysis
2,5-dth	2,5-dithiohexane
dtoxH ₂	1,2-dithiooxalic acid
dtpaH ₅	diethylenetriaminepentaacetic acid
dttf	dibenzotetrathiafulvalene
DV	discrete variational
DVM	discrete variational method
ebg	ethylbiguanidine
ECL	electrochemiluminescence
eddaH ₂	<i>N,N'</i> -ethylenediaminediacetic acid
edmaH	<i>N</i> -ethylenediamineacetic acid
edptaH ₄	ethylenediphosphinetetraacetic acid
edtaH ₄	ethylenediaminetetraacetic acid
edtp	<i>N,N,N',N'</i> -tetrakis(2'-benzimidazolylmethyl)-1,2-diaminoethane
EELS	electron energy loss spectroscopy
ehidaH ₂	<i>N</i> -(2,6-diethylphenylcarbamoylmethyl)iminodiacetic acid
EHMO	extended Huckel molecular orbital
EHT	extended Huckel theory
en	1,2-diaminoethane

ENDOR	electron-nuclear double resonanace
eoA	ethanolamine
EPR	electron paramagnetic resonance
epyden	2,6-bis{5-(1,4-diazaheptyl)}pyridine
Et	ethyl
etdp	2-ethyltetraphenoxodiphosphazine
EXAFS	extended X-ray absorption fine structure
fbts	1-(α)-furyl-4-benzylamidothiosemicarbazone
fodH	2,2-dimethyl-6,6,7,7,8,8,8-heptafluorooctane-3,5-dione
FT	Fourier transform
glyH	glycine
5'-GMP	guanosine 5'-monophosphate
Hb	haemoglobin
HBPz ₃	hydrotris(pyrazol-1-yl)borate
hedpH ₄	1-hydroxyethane-1,2-diphosphonic acid
hedtaH ₃	N-(hydroxyethyl)ethylenediaminetriacetic acid
hfacacH	1,1,1,5,5,5-hexafluoropentane-2,4-dione
HFS	Hartree-Fock-Slater
hidaH ₂	N-(2,6-dimethylphenylcarbamoylmethyl)iminodiacetic acid
hisH	histidine
hmpa	tris(dimethylamino)phosphine oxide (hexamethylphosphoramide)
hmta	hexamethylenetetraamine
HOMO	highest occupied molecular orbital
HO-8-quin	8-hydroxyquinoline
HPLC	high pressure liquid chromatography
hyp	hypoxanthine; purine-6-one
ileH	isoleucine
imdaH	iminodiethanoic acid
imdien	1,9-bis(4-imidazolyl)-2,5,8-triazanonane
imdpt	1,11-bis(4-imidazolyl)-2,6,10-triazaundecane
imidH	imidazole
5'-IMP	inosine 5'-monophosphate
INDO	intermediate neglect of differential overlap
IR	infrared
ishq	7-iodo-8-hydroxyquinoline-4-sulfonic acid

isonic	isonicotinamide
IT	intervalence transition
LCAO	linear combination of atomic orbitals
leuH	leucine
LMCT	ligand-to-metal charge transfer
LUMO	lowest unoccupied molecular orbital
lysH	lysine
malH ₂	malonic acid
mbg	methylbiguanidine
MbH ₂	myoglobin
mbtH	mercaptobenzothiazole
Me	methyl
3-MeacacH	3-methylpentane-2,4-dione
Me ₆ [14]aneN ₄	5,5,7,12,12,14-hexamethyl-1,4,8,11-tetraaza-cyclotetradecane
4,4'-Me ₂ bipy	4,4'-dimethyl-2,2'-bipyridine
5,5'-Me ₂ bipy	5,5'-dimethyl-2,2'-bipyridine
6,6'-Me ₂ bipy	6,6'-dimethyl-2,2'-bipyridine
Mecp	methylcyclopentadienyl
1-Mecyt	1-methylcytosine
medien	4-methyl-1,4,7-triazaheptane
Meen	N-methyl-1,2-diaminoethane
Me ₂ en	N,N-dimethyl-1,2-diaminoethane
7-Mehyp	7-methylhypoxanthine
Meialo	10-methylisoalloxazine
Me ₂ ialo	3,10-dimethylisoalloxazine
1-Meimid	1-methylimidazole
2,9-Me ₂ phen	2,9-dimethyl-1,10-phenanthroline
4,7-Me ₂ phen	4,7-dimethyl-1,10-phenanthroline
3,4,7,8-Me ₄ phen	3,4,7,8-tetramethyl-1,10-phenanthroline
2-Mepy	2-methylpyridine
3-Mepy	3-methylpyridine
4-Mepy	4-methylpyridine
meth	methionine
Me ₂ violH	1,3-dimethylvioluric acid
mhpH	6-methyl-2-hydroxypyridine
MLCT	metal-to-ligand charge transfer
mntH ₂	cis-1,2-dicyanoethene-1,2-dithiol

MO	molecular orbital
m.p.	melting point
MPiXH ₂	meso-porphyrin-IX
MPiXDMEH ₂	meso-porphyrin-IX-dimethyl ester
mppl	3-methyl-1-phenylphosphole
[MV] ²⁺	1,1'-dimethyl-4,4'-bipyridinium dication (methyl viologen or Paraquat)
[N(2amet)pipzH ₃] ³⁺	N-(2-ammoniummethyl)piperazinium trication
nbd	[2.2.1]-bicyclohepta-1,3-diene
nic	nicotinamide
nmp	N-methyl-2-pyrrolidine
NMR	nuclear magnetic resonance
N,N-Et ₂ en	N,N-diethyl-1,2-diaminoethane
NOE	nuclear Overhauser effect
5-NO ₂ -phen	5-nitro-1,10-phenanthroline
np	2-naphthyl
NQR	nuclear quadrupole resonance
ntaH ₃	nitrioloethanoic acid
ntbt	tris(2-benzothiazolylmethyl)amine
OAc	ethanoate
O-en-N-tnH ₄	3,4:9,10-dibenzo-1,12-diaza-5,8-dioxacyclopentadecane
OEPH ₂	octaethylporphyrin
OMPH ₂	octamethylporphyrin
ompha	octamethylpyrophosphoramide
8-O-quin	8-hydroxyquinoline anion
ORD	optical rotary dispersion
ornH	ornithine
OTTLE	optically transparent thin layer electrode
ox	oxalate
paz	pyridazine
PcH ₂	phthalocyanine
pdtah ₄	propylenediaminetetraacetic acid
pdtH ₂	2-pyrrolidone-1,3-bis(carbodithioic acid)
penH	penicillamine
PES	photoelectron spectroscopy
Ph	phenyl
pheH	phenylalanine

phen	1,10-phenanthroline
4,7-Ph ₂ -phen	4,7-diphenyl-1,10-phenanthroline
pip	piperidine
pmbzph	1-phenyl-3-methyl-4-benzoylpyrazole-5-one
pmdt	1,1,4,7,7-pentamethyl-1,4,7-triazaheptane (pentamethyl-diethylenetriamine)
pmdtcH	pentamethylene dithiocarbamic acid, HS ₂ CN(CH ₂) ₅
pmtfph	1-phenyl-3-methyl-4-etrifluoroethanoylpyrazole-5-one
1,2-pn	1,2-diaminopropane
1,3-pn	1,3-diaminopropane
PPIXDBE	protoporphyrin-IX-dibutyl ester
PPIXDME	protoporphyrin-IX-dimethyl ester
ppl	1-phenylphosphole
PPP	Pariser-Parr-Pople
P(py) ₃	tris(2-pyridyl)phosphine
pq	2-(2-pyridyl)quinoline
Pr	propyl
iPr	iso-propyl (CMe ₂ H)
proH	proline
ptaH ₃	phosphinetriacetic acid
purH	purine
PVP	poly(4-vinylpyridine)
py	pyridine
py-2,6-(COOH) ₂	pyridine-2,6-dicarboxylic acid
pydien	1,9-bis(2-pyridyl)-2,5,8-triazanonane
pydpt	1,11-bis(2-pyridyl)-2,6,10-triazaundecane
py-4-NH ₂	4-aminopyridine
py-4-NMe ₂	4-(N,N-dimethylamino)pyridine
pyNO	pyridine N-oxide
py-2-OH	2-hydroxypyridine
pysalH	N-(2-pyridyl)salicylalimine
py-3-SO ₃ H	pyridine-3-sulfonic acid
pz	pyrazine
pzlH	pyrazole
[pzMe] ⁺	N-methylpyrazinium cation
Φ	quantum yield
quin	quinoline
quin-8-OH	8-hydroxyquinoline

r	bond length
RDS	Raman difference spectroscopy
salH ₂	salicylic acid
sal ₂ enH ₂	<i>N,N'</i> -ethylenebis(salicylideneimine)
sal ₂ phenH ₂	<i>N,N'</i> - <i>o</i> -phenylenebis(salicylideneimine)
sal ₂ propH ₂	<i>N,N'</i> -trimethylenebis(salicylideneimine)
sbtS	1-salicyl-4-benzylamidothiosemicarbazone
SCE	saturated calomel electrode
SCF	self-consistent field
SCMP	self-consistent Madelung potential
SDS	sodium dodecyl sulfate
serH	serine
SERS	surface enhanced Raman spectroscopy
SHE	standard hydrogen electrode
sq	1,2-benzosemiquinone
squH ₂	squaric acid
SW	scattered wave
T _C	Curie temperature
T _N	Neel temperature
taaH ₂	1,8-dihydrodibenzo[<i>b,i</i>][1,4,8,11]tetraazaannulene
tacd	1,4,7-triazacyclodecane
tach	<i>cis,cis</i> -1,3,5-triaminocyclohexane
tactd	1,4,8,11-tetraazacyclotetradecane
tacpd	1,4,8,12-tetraazacyclopentadecane
tame	1,1,1-tris(aminomethyl)ethane
tarH ₂	4-(2-thiazolylazo)resorcinol
tarH ₂	tartaric acid
tbcyclen	1,4,7,10-Bz ₄ -[12]ane-1,4,7,10-N ₄
TBPH ₂	tetrabenzoporphyrin
TCDD	2,3,7,8-tetrachlorodibenzo- <i>p</i> -dioxin
tcne	tetracyanoethene
TCNQ	7,7,8,8-tetracyanoquinodimethane (2,5-cyclohexadiene-Δα,4α'-dimalonitrile)
tddx	<i>P,P,P',P'</i> -tetrakis(2-diphenylphosphinoethyl)-α,α'-diphospha-1,4-xylene
tedtaH ₄	thiobis(ethylenenitrilo)tetraacetic acid
teen	<i>N,N,N',N'</i> -tetraethyl-1,2-diaminoethane
teoa	triethanolamine

terpy	2,2':6',2"-terpyridine
2,3,2-tet	1,4,8,11-tetraazaundecane
3,2,3-tet	1,5,8,12-tetraazadodecane
3,3,3-tet	1,5,9,13-tetraazatridecane
tetraphos	1,1,4,7,10,10-hexaphenyl-1,4,7,10-tetraphosphadecane
tetren	1,11-diamino-3,6,9-triazaundecane
tfa	trifluoroethanoate
tfacacH	1,1,1-trifluoropentane-2,4-dione
TGA	thermogravimetric analysis
thH	thiamine
thf	tetrahydrofuran
thrH	threonine
tht	tetrahydrothiophene
thtfacH	2-thenoyltrifluoropropanone
tim	2,3,9,10-Me ₄ -[14]-1,3,8,10-tetraene-1,4,8,11-N ₄ (Me ₄ [14]tetraeneN ₄)
tipp	tri(isopropyl)phosphate
TIPPPH ₂	<i>meso</i> -tetra(isopropyl-4-phenyl)porphyrin
TLC	thin layer chromatography
tmc	tetramethylcyclam
tmen	<i>N,N,N',N'</i> -tetramethyl-1,2-diaminoethane
tmH ₃	thiomalic acid
tmp	trimethylphosphate
tmso	tetramethylenesulfoxide
tmtu	tetramethylthiourea
tmu	tetramethylurea
tp	tris{2-(diphenylphosphino)ethyl}phosphine
TPPH ₂	<i>meso</i> -tetraphenylporphyrin
TPPSH ₆	<i>meso</i> -tetrakis(phenyl-4-sulfonic acid)porphyrin
tpt	2,4,6-tri(2-pyridyl)-1,3,5-triazine
tren	2,2',2"-triaminotriethylamine
trenMe ₆	2,2',2"-tris(dimethylamino)triethylamine
trien	1,8-diamino-3,6-diazaoctane (triethylenetetraamine)
triphos	1,1,1-tris(diphenylphosphinomethyl)ethane
Ts	4-toluenesulfonyl (MeC ₆ H ₄ -4-SO ₂)
ttp	tri-4-tolylphosphate
TPPH ₂	<i>meso</i> -tetra(4-tolyl)porphyrin
tu	thiourea
tyr	tyrosine

5'-UMP	uridine 5'-monophosphate
UV	ultraviolet
UVPES	ultraviolet photoelectron spectroscopy
UV-VIS	ultraviolet-visible
UV-VIS-NIR	ultraviolet-visible-near infrared
$\Delta V^\ddagger$	activation volume
valH	valine
violH ₃	violuric acid
VT	variable temperature
xan	xanthate, $[S_2C(OR)]^-$
XPES	X-ray photoelectron spectroscopy
ZFS	zero field splitting