

LIST OF ABBREVIATIONS

Å	Ångstrom
Ac	ethanoyl
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
adH	adenine
adipH ₂	adipic acid
AES	Auger electron spectroscopy
alaH	alanine
Am	amyl (pentyl)
'Am	<i>t</i> -amyl (CEtMe ₂)
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
bcc	body-centred cubic
bchd	bicyclo[2.2.1]hepta-2,5-diene; norbornadiene
BEDT-TTF	bisethylenedithiotetrathiofulvalene
benzH	benzoin, PhCH(OH)COPh
bg	biguanidine
BHy	a benzoyl hydrazone
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
BPHA	<i>N</i> -benzoyl- <i>N</i> -phenylhydroxylamine
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 Bu	<i>iso</i> -butyl (Me ₂ CHCH ₂)
^t Bu	<i>tert</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

CARBOPLATIN	diammine platinum cyclobutane dicarboxylate
catH	catechol (1,2-dihydroxybenzene)
ccp	cubic close-packed
CD	circular dichroism
CF	crystal field
CHIP	<i>cis,cis,trans</i> -[Pt(NH ₂ CHMe ₂) ₂ Cl ₂ (OH) ₂]
chiraphos	2,3-bis(diphenylphosphino)butane
1,3-chxn	<i>cis</i> -1,3-cyclohexanediamine
CI	chemical ionization
<i>cis</i> -platin	<i>cis</i> -[Pt(NH ₃) ₂ Cl ₂]
citH	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
cp*	η^5 -pentamethylcyclopentadienyl
cp ^t	η^5 - <i>tert</i> -butylcyclopentadienyl, Me ₃ CC ₃ H ₄
CPL	circularly polarized luminescence
cpta	<i>trans</i> -1,2-diaminocyclopentane

CSA	chemical shift anisotropy
CT	charge transfer
CV	cyclic voltammetry
Cy	cyclohexyl
cych	cyclohexyl
cyclam	1,4,8,11-tetraazacyclotetradecane
cyclen	1,4,7,10-tetraazacyclododecane
cyclops	difluoro{3,3'-(trimethylenedinitrilo)bis(2-butanoneoximato)}borate
cysH	cysteine
γ	specific heat coefficient
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)
dbmH	1,3-diphenylpropane-1,3-dione
dbp	5-phenyl-5- <i>H</i> -dibenzophosphole
dbpdioP	<i>R,R-trans</i> -4,5-bis(dibenzophospholomethyl-2,2-dimethyl-1,3-dioxolan
dbtff	dibenzotetrathiofulvalene
dbzmH	1,3-diphenylpropane-1,3-dione (dibenzoylmethane)
DC	direct current
DCI	desorption chemical ionization
dcpzH ₂	2,5-pyrazine dicarboxylic acid
DCTAH ₄	1,2-diaminocyclohexanetetraacetic 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- <i>O</i> -diisopropylidene-2,3-dihydroxy-1,4-bis(diphenylphosphino)-butane
diox	1,4-dioxan
dipicH ₂	pyridine-2,6-dicarboxylic acid

dipp	1,3-bis(<i>diisopropylphosphino</i>)propane
dma	dimethylethanamide
dmbg	dimethylbiguanidine
dmbpdo	3,3'-dimethyl-2,2'-bipyridine <i>N,N'</i> -dioxide
dme	1,2-dimethoxyethane
dmen	<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)methane
dmppl	3,4-dimethyl-1-phenylphosphole
dmpzlH	3,5-dimethylpyrazole
dmso	dimethylsulfoxide
dmu	<i>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)
dppm	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
E_a	activation energy
E_F	Fermi energy
ebg	ethylbiguanidine
ECL	electrochemiluminescence
eddaH ₂	<i>N,N'</i> -ethylenediaminediacetic acid
edmaH	<i>N</i> -ethylenediamineacetic acid
edptaH ₄	ethylenediphosphetetraacetic 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 Hückel molecular orbital
EHT	extended Hückel theory
EI	electron-impact
en	1,2-diaminoethane
ENDOR	electron-nuclear double resonance
eo	ethanolamine
EPR	electron paramagnetic resonance
epyden	2,6-bis{5-(1,4-diazahexyl)}pyridine
Et	ethyl
etdp	2-ethyltetraphenoxodiphosphazine
eV	electron volt
EXAFS	extended X-ray absorption fine structure
FAB	fast-atom-bombardment
fbts	1-(α)-furyl-4-benzylamidothiosemicarbazone
Fc	ferrocenyl, (C ₅ H ₅)Fe(C ₅ H ₅)
fcc	face-centred cubic
fodH	2,2-dimethyl-6,6,7,7,8,8,8-heptafluorooctane-3,5-dione

FT	Fourier transform
FTMS	Fourier transform mass spectrometry
GLC	gas-liquid chromatography
glyH	glycine
5'-GMP	guanosine 5'-monophosphate
<i>H</i>	magnetic field
hapH	2-hydroxyacetophenone
Hb	haemoglobin
HBPz ₃	hydrotris(pyrazol-1-yl)borate
hedpH ₄	1-hydroxyethane-1,2-diphosphonic acid
hedtaH ₃	<i>N</i> -(hydroxyethyl)ethylenediaminetriacetic acid
hfacacH	1,1,1,5,5,5-hexafluoropentane-2,4-dione
HFS	Hartree-Fock-Slater
hidaH ₂	<i>N</i> -(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
idaH ₂	iminodiethanoic acid, HN(CH ₂ COOH) ₂
ileH	isoleucine
imdaH ₂	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
IP	intraperitoneal
IR	infrared
ishq	7-iodo-8-hydroxyquinoline-4-sulfonic acid
isonic	isonicotinamide
IT	intervalence transition
IV	intravenous

LCAO	linear combination of atomic orbitals
leuH	leucine
LMCT	ligand-to-metal charge transfer
LO	longitudinal optical
LUMO	lowest unoccupied molecular orbital
lysH	lysine
malH ₂	malonic acid
mbg	methylbiguanidine
MbH ₂	myoglobin
mbtH	mercaptobenzothiazole
MCD	magnetic circular dichroism
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-tetraazacyclotetradecane
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	<i>N</i> -methyl-1,2-diaminoethane
Me ₂ en	<i>N,N</i> -dimethyl-1,2-diaminoethane
7-Mehyp	7-methylhypoxanthine
Meialo	10-methylisoalloxazine
Me ₂ jalo	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
midaH ₂	<i>N</i> -methyliminodiethanoic acid, MeN(CH ₂ COOH) ₂
MLCT	metal-to-ligand charge transfer
mntH ₂	<i>cis</i> -1,2-dicyanoethene-1,2-dithiol
MO	molecular orbital

m.p.	melting point
MPIXH ₂	<i>meso</i> -porphyrin-IX
MPIXDMEH ₂	<i>meso</i> -porphyrin-IX-dimethyl ester
mppl	3-methyl-1-phenylphosphole
MS	mass spectrometry
[MV] ²⁺	1,1'-dimethyl-4,4'-bipyridinium dication (methyl viologen or Paraquat)
[N(2amet)pipzH ₃] ³⁺	<i>N</i> -(2-ammoniummethyl)piperazinium trication
nbd	[2.2.1]-bicyclohepta-1,3-diene
nic	nicotinamide
nmp	<i>N</i> -methyl-2-pyrrolidine
NMR	nuclear magnetic resonance
<i>N,N</i> -Et ₂ en	<i>N,N</i> -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
oaoH ₂	2,3-dimethylbutane-1,4-dione dioxime (dimethylglyoxime)
O-en-N-tnH ₄	3,4:9,10-dibenzo-1,12-diaza-5,8-dioxacyclopentadecane
OEPH ₂	octaethylporphyrin
OMPH ₂	octamethylporphyrin
ompha	octamethylpyrophosphoramidate
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
2-pic	2-methylpyridine
3-pic	3-methylpyridine
4-pic	4-methylpyridine
pip	piperidine
pmbzpzH	1-phenyl-3-methyl-4-benzoylpyrazole-5-one
pmdt	1,1,4,7,7-pentamethyl-1,4,7-triazaheptane(pentamethyldiethylenetriamine)
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
ⁱ Pr	<i>iso</i> -propyl (CMe ₂ H)
proH	proline
ptaH ₃	phosphinetriacetic acid
purH	purine
PVA	poly(vinyl acetate)
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-(<i>N,N</i> -dimethylamino)pyridine
pyNO	pyridine <i>N</i> -oxide
py-2-OH	2-hydroxypyridine
pysalH	<i>N</i> -(2-pyridyl)salicylalimine
py-3-SO ₃ H	pyridine-3-sulfonic acid
pz	pyrazine
pzlH	pyrazole
[pzMe] ⁺	<i>N</i> -methylpyrazinium cation
Φ	quantum yield

quin	quinoline
quin-8-OH	8-hydroxyquinoline
<i>r</i>	bond length
RBS	Rutherford back-scattering
RDS	Raman difference spectroscopy
RNA	ribonucleic acid
SacSacH	pentane-2,4-dithione
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)
sarH	sarcosine (<i>N</i> -methylglycine, MeNHCH ₂ CO ₂ H)
sbts	1-salicyl-4-benzylamidothiosemicarbazone
SCE	saturated calomel electrode
SCF	self-consistent field
SCMP	self-consistent Madelung potential
SDS	sodium dodecyl sulfate
SEM	scanning electron microscopy
serH	serine
SERS	surface enhanced Raman spectroscopy
SHE	standard hydrogen electrode
sq	1,2-benzosemiquinone
squH ₂	squaric acid
SW	scattered wave
<i>T_c</i>	Curie temperature
<i>T_N</i>	Néel temperature
taaH	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
tartH 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- $\Delta 1\alpha,4\alpha'$ -dimalonitrile)
tdxx	<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
TEM	transmission electron microscopy
teoa	triethanolamine
terpy	2,2':6',2"-terpyridine
2,3,2-tet	1,4,8,11-tetrazaundecane
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
TIPPH 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
TO	transverse optical
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
trpH	tryptophan
Ts	4-toluenesulfonyl ($\text{MeC}_6\text{H}_4\text{-4-SO}_3$)
TSF	tetraselenofulvalene
TTF	tetrathiofulvalene
ttp	tri-4-tolylphosphate
TTPH 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 ₂	violuric acid
VT	variable temperature
xan	xanthate, $[\text{S}_2\text{C(OR)}]^-$
XANES	X-ray absorption near-edge structure
XPES	X-ray photoelectron spectroscopy
ZFS	zero field splitting