

# Abbreviations

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Ac	acetate
acac	acetylacetonate
acacen	NN'-ethylenebis(acetylacetonone iminate)
Ad	adamantyl
AIBN	azoisobutyronitrile
Ar	Aryl
Ar*	2,4,6-tri(t-butyl)phenyl
arphos	1-(diphenylphosphino)-2-(diphenylarsino)ethane
ATP	adenosine triphosphate
Azb	azobenzene
9-BBN	9-borabicyclo[3.3.1]nonane
BHT	2,6-dibutyl-4-methylphenyl
BINAP	2,2'-bis(diphenylphosphino)-1,1'-binaphthyl
bipy	2,2'-bipyridyl
Bis	bis(trimethylsilyl)methyl
BNCT	boron neutron capture therapy
Bp	biphenyl
Bz	benzyl
Bzac	benzoylacetate
cbd	cyclobutadiene
1,5,9-cdt	cyclododeca-1,5,9-triene
chd	cyclohexadiene
chpt	cycloheptatriene
CIDNP	Chemically Induced Asymmetric Nuclear Polarisation
[Co]	cobalamin
(Co)	cobaloxime [Co(dmg) <sub>2</sub> derivative]
cod	cyclo-octa-1,5-diene
cot	cyclo-octatriene
CP/MAS	Cross Polarization/Magnetic Angle Spinning
Cp	$\eta^5$ -cyclopentadienyl
Cp*	$\eta^5$ -pentamethylcyclopentadienyl
Cp'	trimethylsilylcyclopentadienyl
Cp''	tetramethylethylcyclopentadienyl
Cy	cyclohexyl
Cyclam	1,4,8,11-tetrazaacyclotetradecane
Cyttp	PhP(CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> PCy <sub>2</sub> ) <sub>2</sub>
dab	1,4-diazabutadiene
dabco	1,4-diazabicyclo[2.2.2]octane
dba	dibenzylideneacetone
DBU	1,8-diazabicyclo[5.4.0]undec-7-ene
DCA	9,10-dicyanoanthracene
depe	1,2-bis(diethylphosphino)ethane
depn	1,2-bis(diethylphosphino)methane
diars	o-phenylenebis(dimethyl)arsine
diarsop	{[(2,2-dimethyl-1,3-dioxolan-4,5-diyl)bis-(methylene)]bis[diphenylarsine]}

dien	diethylenetriamine
diop	{{(2,2-dimethyl-1,3-dioxolan-4,5-diy)bis-(methylene)}bis[diphenylphosphine]}
DIPAMP	1,2-bis(phenyl-o-anisoylphosphino)ethane
diphos	1,2-bis(diphenylphosphino)ethane
Dipp	2,6-di-isopropylphenyl
dipyam	di-(2-pyridyl)amine
DMAD	dimethyl acetylenedicarboxylate
DMAP	2-dimethylaminopyridine
DME	dimethoxyethane
DMF	NN-dimethylformamide
dmg	dimethylglyoximate
dmgH	monoanion of dimethylglyoxime
dmgH <sub>2</sub>	dimethylglyoxime
DMP	dimethylpiperazine
dmpe	1,2-bis(dimethylphosphino)ethane
dmpm	bis(dimethylphosphino)methane
DMSO	dimethyl sulphoxide
dpae	1,2-bis(diphenylarsino)ethane
dpam	bis(diphenylarsino)methane
dppa	1,2-bis(diphenylphosphino)ethyne
dppb	1,4-bis(diphenylphosphino)butane
dppe	1,2-bis(diphenylphosphino)ethane
dppf	1,1'-bis(diphenylphosphino)ferrocene
dppm	bis(diphenylphosphino)methane
dppp	1,3-bis(diphenylphosphino)propane
DSD	diamond-square-diamond
edt	ethane-1,2-dithiolate
EDTA	ethylenediaminetetraacetate
ee	enantiomeric excess
EELS	electron energy loss spectroscopy
en	ethylene-1,2-diamine
EXAFS	extended X-ray absorption fine structure
F <sub>6</sub> acac	hexafluoroacetylacetonate
Fc	ferrocenyl
Fe*	Fe(CO) <sub>2</sub> Cp*
Fp	Fe(CO) <sub>2</sub> Cp
Fp'	Fe(CO) <sub>2</sub> ( <sup>l</sup> -C <sub>5</sub> H <sub>4</sub> Me)
FTIR	Fourier Transform Infra-red
FVP	flash vacuum pyrolysis
glyme	ethyleneglycol dimethyl ether
GVB	generalized valence bond
HBpz3	tris(pyrazolyl)borate
HBpz*3	tris(3,5-dimethylpyrazolyl)borate
H <sub>4</sub> cyclen	tetraaza-1,4,7,10-cyclododecane
HEDTA	N-hydroxyethylethylenediaminetetraacetate
hfa	hexafluoroacetone
hfacac	hexafluoroacetylacetonato
hfb	hexafluorobutyne
HMPA	hexamethyl phosphoric triamide
HNCC	high nuclearity carbonyl cluster
HOMO	highest occupied molecular orbital

IGLO	individual Gauge for localized Orbitals
Is*	2,4,6-tri-isopropylphenyl
ISEELS	inner shell electron energy loss spectroscopy
LDA	lithium diisopropylamide
LiDBB	lithium di- <i>t</i> -butylbiphenyl
LNCC	low nuclearity carbonyl cluster
MAO	methyl alumoxane
Me <sub>6</sub> [14]dieneN <sub>4</sub>	5,7,7,12,14,14-hexamethyl-1,4,8,11-tetra-azacyclotetra-4,11-diene
Me <sub>6</sub> [14]N <sub>4</sub>	5,5,7,12,12,14-hexamethyl-1,4,8,11-tetra-azacyclotetradecane
4,7-Me <sub>2</sub> phen	4,7-dimethyl-1,10-phenanthroline
3,4,7,8-Me <sub>4</sub> phen	3,4,7,8-tetramethyl-1,10-phenanthroline
Mes	mesityl
Mes*	2,4,6-tri-butylphenyl
MeTHF	Methyltetrahydrofuran
mcpba	metachloroperbenzoic acid
MLCT	Metel-Ligand Charge Transfer
nap	1-naphthyl
nbd	norbornadiene
NBS	N-bromosuccinimide
NCS	N-chlorosuccinimide
NCT	neutron capture theory
Neo	neopentyl
Np	Neophyl
np <sub>3</sub>	N(CH <sub>2</sub> CH <sub>2</sub> PPh <sub>2</sub> ) <sub>3</sub>
nta	nitrioltriacetate
OEP	octaethylporphyrin
OTf	trifluoromethane sulphonate
Pc	phthalocyanin
PES	photoelectron spectroscopy
PMDT	pentamethylenediethylenetetramine
pd	pentane-2,4-dionate
phen	1,10-phenanthroline
pmedta	pentamethyldiethylenetriamine
pp <sub>3</sub>	P(CH <sub>2</sub> CH <sub>2</sub> PPh <sub>2</sub> ) <sub>3</sub>
[PPN] <sup>+</sup>	[(Ph <sub>3</sub> P) <sub>2</sub> N] <sup>+</sup>
py	pyridine
pz	pyrazolyl
R-PROPHOS	(R)-(+)-1,2-bis(diphenylphosphino)propane
R,R-SKEWPHOS	(2R,4R)-bis(diphenylphosphino)pentane
RDF	radial distribution function
ROMP	ring opening metathesis polymerisation
sal	salicylaldehyde
salen	NN'-bis(salicylaldehyde)ethylenediamine
saloph	NN-bisacyclidene- <i>o</i> -phenylenediamine
SCF	self consistent field
TCNE	tetracyanoethylene
TCNQ	7,7,8,8-tetracyanoquinodimethane
terpy	2,2',2''-terpyridyl
tetraphos	1,1,4,7,10,10-hexaphenyl-1,4,7,10-tetraphosphadecane
TFA	trifluoroacetic acid
tfacac	trifluoroacetylacetonato

tfo	triflate, trifluoromethylsulphonate
THF	tetrahydrofuran
tht	tetrahydrothiophen
TMBD	NNN'N'-tetramethyl-2-butene-1,4-diamine
TMEDA (tmena)	tetramethylethylenediamine
tmp	2,2,6,6-tetramethylpiperidino
TMS	tetramethylsilane
tol	tolyl
TPP	meso-tetraphenylporphyrin
Trip	2,4,6-triisopropylphenyl
triphos	1,1,1-tris(diphenylphosphinomethyl)ethane
TRIR	Time resolved infrared (spectroscopy)
Tsi	tris(trimethylsilyl)methyl (Me <sub>3</sub> Si) <sub>3</sub> C
TTF	tetrathiafulvalene
vi	vinyl
WGSR	water gas shift reaction
XPS	X-Ray Photoelectron spectroscopy
Xyl	xylyl