

## LIST OF ABBREVIATIONS

|                                    |                                              |
|------------------------------------|----------------------------------------------|
| Å                                  | Ångstrom                                     |
| AC                                 | alternating current                          |
| acac <sub>2</sub> enH <sub>2</sub> | <i>N,N'</i> -ethylenebis(acetylacetimine)    |
| acacH                              | pentane-2,4-dione                            |
| adaH <sub>2</sub>                  | <i>N</i> -(2-acetamido)iminodiacetic acid    |
| adH                                | adenine                                      |
| adipH <sub>2</sub>                 | adipic acid                                  |
| AES                                | Auger electron spectroscopy                  |
| alaH                               | alanine                                      |
| Am                                 | amyl                                         |
| 5'-AMP                             | adenosine 5'-monophosphate                   |
| ampy                               | 2-(aminomethyl)pyridine                      |
| amq                                | 8-aminoquinoline                             |
| [9]aneN <sub>3</sub>               | 1,4,7-triazacyclononane                      |
| [15]aneN <sub>4</sub>              | 1,4,8,12-tetraazacyclopentadecane            |
| [16]aneN <sub>4</sub>              | 1,5,9,13-tetraazacyclohexadecane             |
| [13]aneS <sub>4</sub>              | 1,4,7,10-tetrathiacyclotridecane             |
| [14]aneS <sub>4</sub>              | 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 |
| bg                                 | biguanidine                                  |
| blimH                              | 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 <sub>4</sub>                   | tetrakis(pyrazol-1-yl)borate                 |

|                          |                                                          |
|--------------------------|----------------------------------------------------------|
| bq                       | 1,2-benzoquinone                                         |
| bqd                      | benzoquinone dioximate                                   |
| bta                      | 2,2'-bi-2-thiazoline                                     |
| Bu                       | butyl                                                    |
| <sup>t</sup> Bu          | <i>t</i> -butyl (CMe <sub>3</sub> )                      |
| Bz                       | benzyl                                                   |
| bzacH                    | 1-phenylbutane-1,3-dione (benzoylacetone)                |
| bzd                      | benzidine                                                |
| bzimidH                  | benzimidazole                                            |
| bzo[15]eneS <sub>4</sub> | 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 <sub>2</sub> CHMe <sub>2</sub> ) <sub>2</sub> Cl <sub>2</sub> (OH) <sub>2</sub> ] |
| 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 <sub>3</sub> ) <sub>2</sub> Cl <sub>2</sub> ]                                               |
| citH <sub>3</sub>  | 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 <sup>5</sup> -cyclopentadienyl                                                                               |
| cp*                | η <sup>5</sup> -pentamethylcyclopentadienyl                                                                    |
| CPL                | circularly polarized luminescence                                                                              |
| cpta               | <i>trans</i> -1,2-diaminocyclopentane                                                                          |
| CSA                | chemical shift anisotropy                                                                                      |
| 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-oximate)}borate                                            |

|                     |                                                                                                        |
|---------------------|--------------------------------------------------------------------------------------------------------|
| cysH                | cysteine                                                                                               |
| $\gamma$            | 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-<br>-1,3-dioxolan                       |
| dbttf               | dibenzotetrathiofulvalene                                                                              |
| dbzmH               | 1,3-diphenylpropane-1,3-dione (dibenzoylmethane)                                                       |
| DC                  | direct current                                                                                         |
| DCI                 | desorption chemical ionization                                                                         |
| dcpzH <sub>2</sub>  | 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 <sub>2</sub>  | 1,4-dihydroxyanthraquinone                                                                             |
| dlars               | 1,2-phenylenebis(dimethylarsine)                                                                       |
| dien                | 1,4,7-triazaheptane {diethylenetriamine; bis(2-amino-<br>ethyl)amine}                                  |
| dikH                | 1,3-diketone ( $\beta$ -diketone)                                                                      |
| dim                 | 2,3-Me <sub>2</sub> -[14]-1,3-diene-1,4,8,11-N <sub>4</sub> {Me <sub>2</sub> [14]dieneN <sub>4</sub> } |
| (+)-diop            | (+)-2,3- <i>O</i> -diisopropylidene-2,3-dihydroxy-1,4-bis-<br>(diphenylphosphino)butane                |
| diox                | 1,4-dioxan                                                                                             |
| dipicH <sub>2</sub> | 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                                                                                    |
| dmen                | <i>N,N'</i> -dimethyl-1,2-diaminoethane                                                                |
| dmf                 | dimethylmethanamide                                                                                    |
| dmg                 | dimethylglyoximate                                                                                     |

|                    |                                                          |
|--------------------|----------------------------------------------------------|
| dmgH <sub>2</sub>  | dimethylglyoxime                                         |
| dmbH               | 5,5-dimethylhexane-2,4-dione                             |
| dnhpH              | 2,4-dimethyl-6-hydroxypyrimidine                         |
| dmpc               | 1,2-bis(dimethylphosphino)ethane                         |
| dmpm               | bis(dimethylphosphino)methane                            |
| dmppl              | 3,4-dimethyl-1-phenylphosphole                           |
| dmpzIH             | 3,5-dimethylpyrazole                                     |
| dmso               | dimethylsulfoxide                                        |
| dmu                | <i>N,N'</i> -dimethylurea                                |
| DNA                | deoxyribonucleic acid                                    |
| dpac               | 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                     |
| dpphc              | 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 <sub>2</sub> | 1,2-dithiooxalic acid                                    |
| dtpaH <sub>5</sub> | diethylenetriaminepentaacetic acid                       |
| dtf                | dibenzotetrathiafulvalene                                |
| DV                 | discrete variational                                     |

|                     |                                                                                |
|---------------------|--------------------------------------------------------------------------------|
| DVM                 | discrete variational method                                                    |
| $E_a$               | activation energy                                                              |
| $E_F$               | Fermi energy                                                                   |
| ebg                 | ethylbiguanidine                                                               |
| ECL                 | electrochemiluminescence                                                       |
| eddaH <sub>2</sub>  | <i>N,N'</i> -ethylenediaminediacetic acid                                      |
| edmaH               | <i>N</i> -ethylenediamineacetic acid                                           |
| edptaH <sub>4</sub> | ethylenediphosphinetetraacetic acid                                            |
| edtaH <sub>4</sub>  | ethylenediaminetetraacetic acid                                                |
| edtp                | <i>N,N,N',N'</i> -tetrakis(2'-benzimidazolylmethyl)-1,2-diaminoethane          |
| EELS                | electron energy loss spectroscopy                                              |
| chidaH <sub>2</sub> | <i>N</i> -(2,6-diethylphenylcarbamoylmethyl)iminodiacetic acid                 |
| EHMO                | extended Huckel molecular orbital                                              |
| EHT                 | extended Huckel theory                                                         |
| EI                  | electron-impact                                                                |
| en                  | 1,2-diaminoethane                                                              |
| ENDOR               | electron-nuclear double resonance                                              |
| coa                 | ethanolamine                                                                   |
| EPR                 | electron paramagnetic resonance                                                |
| epyen               | 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-( $\alpha$ )-furyl-4-benzylamidothiosemicarbazone                            |
| Fc                  | ferrocenyl, (C <sub>5</sub> H <sub>5</sub> )Fe(C <sub>5</sub> H <sub>4</sub> ) |
| 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                                                  |
| Hb                  | haemoglobin                                                     |
| HBPz <sub>3</sub>   | hydrotris(pyrazol-1-yl)borate                                   |
| hedpH <sub>4</sub>  | 1-hydroxyethane-1,2-diphosphonic acid                           |
| hedtaH <sub>3</sub> | <i>N</i> -(hydroxyethyl)ethylenediaminetriacetic acid           |
| hfacacH             | 1,1,1,5,5,5-hexafluoropentane-2,4-dione                         |
| HFS                 | Hartree-Fock-Slater                                             |
| hidaH <sub>2</sub>  | <i>N</i> -(2,6-dimethylphenylcarbamoylmethyl)iminodiacetic acid |
| hisH                | histidine                                                       |
| hmpa                | tris(dimethylamino)phosphine oxide (hexamethyl-phosphoramide)   |
| hmta                | hexamethylenetetraamine                                         |
| HOMO                | highest occupied molecular orbital                              |
| HO-8-quin           | 8-hydroxyquinoline                                              |
| HPLC                | high pressure liquid chromatography                             |
| hyp                 | hypoxanthine; purine-6-one                                      |
| idaH <sub>2</sub>   | iminodiacetic acid, HN(CH <sub>2</sub> COOH) <sub>2</sub>       |
| ileH                | isoleucine                                                      |
| imdaH <sub>2</sub>  | iminodiacetic 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 <sub>2</sub>                     | malonic acid                                                         |
| mbg                                   | methylbiguanidine                                                    |
| MbH <sub>2</sub>                      | myoglobin                                                            |
| mbtH                                  | mercaptobenzothiazole                                                |
| MCD                                   | magnetic circular dichroism                                          |
| Me                                    | methyl                                                               |
| 3-MeacacH                             | 3-methylpentane-2,4-dione                                            |
| Me <sub>6</sub> [14]aneN <sub>4</sub> | 5,5,7,12,12,14-hexamethyl-1,4,8,11-tetraaza-cyclotetradecane         |
| 4,4'-Me <sub>2</sub> bipy             | 4,4'-dimethyl-2,2'-bipyridine                                        |
| 5,5'-Me <sub>2</sub> bipy             | 5,5'-dimethyl-2,2'-bipyridine                                        |
| 6,6'-Me <sub>2</sub> 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 <sub>2</sub> en                    | N,N-dimethyl-1,2-diaminoethane                                       |
| 7-Mehyp                               | 7-methylhypoxanthine                                                 |
| Meialo                                | 10-methylisalloxazine                                                |
| Me <sub>2</sub> ialo                  | 3,10-dimethylisalloxazine                                            |
| 1-Meimid                              | 1-methylimidazole                                                    |
| 2,9-Me <sub>2</sub> phen              | 2,9-dimethyl-1,10-phenanthroline                                     |
| 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                              |
| 2-Mepy                                | 2-methylpyridine                                                     |
| 3-Mepy                                | 3-methylpyridine                                                     |
| 4-Mepy                                | 4-methylpyridine                                                     |
| methH                                 | methionine                                                           |
| Me <sub>2</sub> violH                 | 1,3-dimethylvioluric acid                                            |
| mhpH                                  | 6-methyl-2-hydroxypyridine                                           |
| midaH <sub>2</sub>                    | N-methyliminodiethanoic acid, MeN(CH <sub>2</sub> COOH) <sub>2</sub> |
| MLCT                                  | metal-to-ligand charge transfer                                      |
| mntH <sub>2</sub>                     | cis-1,2-dicyanoethene-1,2-dithiol                                    |
| MO                                    | molecular orbital                                                    |
| m.p.                                  | melting point                                                        |
| MPIXH <sub>2</sub>                    | meso-porphyrin-IX                                                    |
| MPIXDMEH <sub>2</sub>                 | meso-porphyrin-IX-dimethyl ester                                     |
| mppl                                  | 3-methyl-1-phenylphosphole                                           |
| MS                                    | mass spectrometry                                                    |

|                                             |                                                                        |
|---------------------------------------------|------------------------------------------------------------------------|
| [MV] <sup>2+</sup>                          | 1,1'-dimethyl-4,4'-bipyridinium dication (methyl viologen or Paraquat) |
| [N(2amet)pipzH <sub>3</sub> ] <sup>3+</sup> | 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 <sub>2</sub> en                      | N,N-diethyl-1,2-diaminoethane                                          |
| NOE                                         | nuclear Overhauser effect                                              |
| 5-NO <sub>2</sub> -phen                     | 5-nitro-1,10-phenanthroline                                            |
| np                                          | 2-naphthyl                                                             |
| NQR                                         | nuclear quadrupole resonance                                           |
| ntaH <sub>3</sub>                           | nitroethanoic acid                                                     |
| ntbt                                        | tris(2-benzothiazolylmethyl)amine                                      |
| OAc                                         | ethanoate                                                              |
| oaoH <sub>2</sub>                           | 2,3-dimethylbutane-1,4-dione dioxime (dimethylglyoxime)                |
| O-en-N-tnH <sub>4</sub>                     | 3,4:9,10-dibenzo-1,12-diaza-5,8-dioxacyclopentadecane                  |
| OEPH <sub>2</sub>                           | octaethylporphyrin                                                     |
| OMPH <sub>2</sub>                           | 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 <sub>2</sub>                            | phthalocyanine                                                         |
| pdaH <sub>4</sub>                           | propylenediaminetetraacetic acid                                       |
| pdtH <sub>2</sub>                           | 2-pyrrolidone-1,3-bis(carbodithioic acid)                              |
| penH                                        | penicillamine                                                          |
| PES                                         | photoelectron spectroscopy                                             |
| Ph                                          | phenyl                                                                 |
| pheH                                        | phenylalanine                                                          |
| phen                                        | 1,10-phenanthroline                                                    |
| 4,7-Ph <sub>2</sub> -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, $\text{HS}_2\text{CN}(\text{CH}_2)_5$  |
| pmtfpH                     | 1-phenyl-3-methyl-4-trifluoroethanoylpyrazole-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) <sub>3</sub>         | tris(2-pyridyl)phosphine                                                   |
| pq                         | 2-(2-pyridyl)quinoline                                                     |
| Pr                         | propyl                                                                     |
| <i>i</i> Pr                | <i>iso</i> -propyl ( $\text{CMe}_2\text{H}$ )                              |
| proH                       | proline                                                                    |
| ptaH <sub>3</sub>          | phosphinetriacetic acid                                                    |
| purH                       | purine                                                                     |
| PVA                        | poly(vinyl acetate)                                                        |
| PVP                        | poly(4-vinylpyridine)                                                      |
| py                         | pyridine                                                                   |
| py-2,6-(COOH) <sub>2</sub> | pyridine-2,6-dicarboxylic acid                                             |
| pydien                     | 1,9-bis(2-pyridyl)-2,5,8-triazaonane                                       |
| pydpt                      | 1,11-bis(2-pyridyl)-2,6,10-triazaundecane                                  |
| py-4-NH <sub>2</sub>       | 4-aminopyridine                                                            |
| py-4-NMe <sub>2</sub>      | 4-( <i>N,N</i> -dimethylamino)pyridine                                     |
| pyNO                       | pyridine <i>N</i> -oxide                                                   |
| py-2-OH                    | 2-hydroxypyridine                                                          |
| pysalH                     | <i>N</i> -(2-pyridyl)salicylaldehyde                                       |
| py-3-SO <sub>3</sub> H     | pyridine-3-sulfonic acid                                                   |
| pz                         | pyrazine                                                                   |
| pzIH                       | pyrazole                                                                   |
| [pzMe] <sup>+</sup>        | <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 <sub>2</sub>                   | salicylic acid                                                                     |
| sal <sub>2</sub> enH <sub>2</sub>   | <i>N,N'</i> -ethylenebis(salicylideneimine)                                        |
| sal <sub>2</sub> phenH <sub>2</sub> | <i>N,N'</i> - <i>o</i> -phenylenebis(salicylideneimine)                            |
| sal <sub>2</sub> propH <sub>2</sub> | <i>N,N'</i> -trimethylenebis(salicylideneimine)                                    |
| sarH                                | sarcosine ( <i>N</i> -methylglycine, MeNHCH <sub>2</sub> CO <sub>2</sub> 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 <sub>2</sub>                   | squaric acid                                                                       |
| SW                                  | scattered wave                                                                     |
| <br>                                |                                                                                    |
| T <sub>C</sub>                      | Curie temperature                                                                  |
| T <sub>N</sub>                      | Neel temperature                                                                   |
| taaH <sub>2</sub>                   | 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 <sub>2</sub>                   | 4-(2-thiazolylazo)resorcinol                                                       |
| tarH <sub>2</sub>                   | tartaric acid                                                                      |
| tbcyclen                            | 1,4,7,10-Bz <sub>4</sub> -[12]ane-1,4,7,10-N <sub>4</sub>                          |
| TBPH <sub>2</sub>                   | tetrabenzoporphyrin                                                                |
| TCDD                                | 2,3,7,8-tetrachlorodibenzo- <i>p</i> -dioxin                                       |
| tcne                                | tetracyanoethene                                                                   |
| TCNQ                                | 7,7,8,8-tetracyanoquinodimethane (2,5-cyclohexadiene-<br>Δ1α,4α'-dimalonitrile)    |
| tdx                                 | <i>P,P,P',P'</i> -tetrakis(2-diphenylphosphinoethyl)-α,α'-<br>diphospha-1,4-xylene |
| tedtaH <sub>4</sub>                 | thiobis(ethylenenitrilo)tetraacetic acid                                           |

|                     |                                                                                                                           |
|---------------------|---------------------------------------------------------------------------------------------------------------------------|
| teen                | <i>N,N,N',N'</i> -tetraethyl-1,2-diaminoethane                                                                            |
| TEM                 | transmission electron microscopy                                                                                          |
| tea                 | 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 <sub>4</sub> -[14]-1,3,8,10-tetraene-1,4,8,11-N <sub>4</sub><br>(Me <sub>4</sub> [14]tetraeneN <sub>4</sub> ) |
| tipp                | tri(isopropyl)phosphate                                                                                                   |
| TIPPPH <sub>2</sub> | <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 <sub>3</sub>    | thiomalic acid                                                                                                            |
| tmp                 | trimethylphosphate                                                                                                        |
| tnso                | tetramethylenesulfoxide                                                                                                   |
| tmtu                | tetramethylthiourea                                                                                                       |
| tmu                 | tetramethylurea                                                                                                           |
| TO                  | transverse optical                                                                                                        |
| tp                  | tris{2-(diphenylphosphino)ethyl}phosphine                                                                                 |
| TPPH <sub>2</sub>   | <i>meso</i> -tetraphenylporphyrin                                                                                         |
| TPPSH <sub>6</sub>  | <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 <sub>6</sub> | 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 (MeC <sub>6</sub> H <sub>4</sub> -4-SO <sub>2</sub> )                                                   |

|                     |                                               |
|---------------------|-----------------------------------------------|
| TSF                 | tetraselenofulvalene                          |
| TTF                 | tetrathiofulvalene                            |
| ttp                 | tri-4-tolylphosphate                          |
| TTPH <sub>2</sub>   | <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 <sub>3</sub>  | violuric acid                                 |
| VT                  | variable temperature                          |
|                     |                                               |
| xan                 | xanthate, [S <sub>2</sub> C(OR)] <sup>-</sup> |
| XANES               | X-ray absorption near-edge structure          |
| XPES                | X-ray photoelectron spectroscopy              |
|                     |                                               |
| ZFS                 | zero field splitting                          |