

## APPENDIX

### IUPAC Publications on Nomenclature and Symbolism

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Many of the documents referred to, in particular those on organic and biochemical nomenclature, are available in electronic form at <http://www.chem.qmul.ac.uk/iupac>; a search facility is provided for the whole of the collection at this website. For other documents available via the internet, highlighted links to html pages or pdf files are provided.

#### 1.0 Compilations

1.1 Nomenclature of Organic Chemistry, a 550-page hardcover volume published in 1979 by Pergamon, Oxford. A searchable electronic version of this book and the 1993 Guide (item 1.2) is available:

<http://www.acdlabs.com/iupac/nomenclature>.

Section A: Hydrocarbons

Section B: Fundamental heterocyclic systems

Section C: Characteristic groups containing carbon, hydrogen, oxygen, nitrogen, halogen, sulfur, selenium and tellurium

Section D: Organic compounds containing elements not exclusively those referred to in the title of Section C

Section E: Stereochemistry

Section F: General principles for the naming of natural products and related compounds (superseded by 1999 document)

Section H: Isotopically modified compounds

1.2 A Guide to IUPAC Nomenclature of Organic Compounds, a 182-page softcover volume published in 1993 by Blackwell Scientific Publications, Oxford, to be used in conjunction with item 1.1. Corrections published in *Pure Appl. Chem.*, 1999, **71**, 1327. A searchable electronic version of this book and the 1979 Nomenclature of Organic Chemistry (item 1.1) is available at <http://www.acdlabs.com/iupac/nomenclature>.

1.3 Nomenclature of Inorganic Chemistry, a 278-page hardcover volume published in 1990 by Blackwell Scientific Publications, Oxford.

Chapter 1: General aims, functions and methods

Chapter 2: Grammar

Chapter 3: Elements, atoms and groups

Chapter 4: Formulae

Chapter 5: Names based on stoichiometry

Chapter 6: Neutral molecular compounds

Chapter 7: Names for ions, substituent groups and radicals, and salts

Chapter 8: Oxoacids and derived anions

Chapter 9: Co-ordination compounds

Chapter 10: Boron hydrides and related compounds

1.4 Nomenclature of Inorganic Chemistry II, a 130-page hardcover volume published in 2001 by the Royal Society of Chemistry, Cambridge

Chapter 1: Polyaniions

Chapter 2: Isotopically modified inorganic compounds

Chapter 3: Metal complexes of tetrapyrroles

Chapter 4: Hydrides of nitrogen and derived cations, anions and ligands

Chapter 5: Inorganic chain and ring compounds

Chapter 6: Graphite intercalation compounds

Chapter 7: Regular single-strand and quasi single-strand inorganic and coordination polymers

1.5 Biochemical Nomenclature and Related Documents, a 348-page softcover manual published in 1992 by Portland Press Ltd. for IUBMB, and available from the publisher (59 Portland Place, London W1N 3AJ, UK). The contents are as follows (web hyperlinks included where highlighted in blue):

Nomenclature of organic chemistry. Section E: Stereochemistry (1974) (also in item 1.1)

Nomenclature of organic chemistry. Section F: Natural products and related compounds (1976) (also in item 1.1; superseded by 1999 document)

Isotopically modified compounds

Recommendations for the presentation of thermodynamic and related data in biology (1985) (superseded by 1994 document)

Citation of bibliographic references in biochemical journals (1971)

Nomenclature and symbolism for amino acids and peptides (1983)

Abbreviated nomenclature of synthetic polypeptides or polymerized amino acids (1971)

Abbreviations and symbols for the description of the conformation of polypeptide chains (1969)

Nomenclature of peptide hormones (1974)

Nomenclature of glycoproteins, glycopeptides and peptidoglycans (1985)

Nomenclature of initiation, elongation and termination factors for translation in eukaryotes (1988) (superseded by 1995 recommendations)

Nomenclature of multiple forms of enzymes (1976)

Symbolism and terminology in enzyme kinetics (1981)

Nomenclature for multienzymes (1989)

Abbreviations and symbols for nucleic acids, polynucleotides and their constituents (1970)

Abbreviations and symbols for the description of the conformations of polynucleotide chains (1982)

Nomenclature for incompletely specified bases in nucleic acid sequences (1984)

Carbohydrate nomenclature. Part I (1969) (superseded by 1996 document)

Nomenclature of cyclitols (1973)

Numbering of atoms in *myo*-inositol (1988)

Conformational nomenclature for five- and six-membered ring forms of monosaccharides and their derivatives (1980) (superseded by 1996 document)

Nomenclature of unsaturated monosaccharides (1980) (superseded by 1996 document)

Nomenclature of branched-chain monosaccharides (1980) (superseded by 1996 document)

Abbreviated terminology of oligosaccharide chains (1980) (superseded by 1996 document)

Polysaccharide nomenclature (1980) (superseded by 1996 document)

Symbols for specifying the conformation of polysaccharide chains (1981)

Nomenclature of lipids (1976)

Nomenclature of steroids (1989)

Nomenclature of quinones with isoprenoid side chains (1973)

Nomenclature of carotenoids (1970) and amendments (1974)

Nomenclature of tocopherols and related compounds (1981)

Nomenclature of vitamin D (1981)

Nomenclature of retinoids (1981)

Prenol nomenclature (1986)

Nomenclature of phosphorus-containing compounds of biochemical importance (1976)  
Nomenclature and symbols for folic acids and related compounds (1986)  
Nomenclature for vitamins B-6 and related compounds (1973)  
Nomenclature of corrinoids (1973)  
Nomenclature of tetrapyrroles (1986)

1.6 Compendium of Analytical Nomenclature, a 974-page hardcover volume published in 1998 by Blackwell Scientific Publications, Oxford; downloadable pdf files on the IUPAC website. The contents are as follows:

Fundamental physico-chemical terms and quantities used in analytical chemistry  
Presentation of the results of chemical analysis  
Solution thermodynamics  
Precision balances  
Thermoanalytical and enthalpimetric methods  
Titrimetric analysis  
Automatic analysis  
Electrochemical analysis  
Analytical separation methods  
Spectrochemical analysis  
Other optical methods  
Mass spectroscopy  
Diffraction methods  
Magnetic methods of analysis  
Kinetic methods of analysis  
Radioanalytical methods  
Surface analysis  
Quality assurance of analytical processes  
Applications

1.7 Compendium of Macromolecular Nomenclature, a 172-page hardcover volume published in 1991 by Blackwell Scientific Publications, Oxford; downloadable pdf files on the IUPAC website. The contents are as follows:

Basic Definitions of Terms Relating to Polymers  
Stereochemical Definitions and Notations Relating to Polymers  
Definitions of Terms Relating to Individual Macromolecules, their Assemblies, and Dilute Polymer Solutions  
Definitions of Terms Relating to Crystalline Polymers  
Nomenclature of Regular Single-strand Organic Polymers (superseded by 2002 revision)  
Nomenclature for Regular Single-strand and Quasi-single-strand Inorganic and Coordination Polymers  
Source-based Nomenclature for Copolymers  
A Classification of Linear Single-strand Polymers  
Use of Abbreviations for Names of Polymeric Substances

1.8 Compendium of Chemical Terminology: IUPAC Recommendations, a 450-page softcover volume published in 1997 by Blackwell Scientific Publications, Oxford. Searchable electronic edition available on the internet at <http://www.chemsoc.org/goldbook>.

1.9 Quantities, Units and Symbols in Physical Chemistry, a 166-page softcover volume published in 1993 by Blackwell Scientific Publications, Oxford.

## 2.0 Documents not included in the compilations

### 2.1 Nomenclature of Elements and Compounds

#### Aluminium Silicon Oxide Nitrides

Terminology for compounds in the Si–Al–O–N system (*Pure Appl. Chem.*, 1999, **71**, 1765)

#### Boron Compounds

Nomenclature of inorganic boron compounds (*Pure Appl. Chem.*, 1972, **30**, 681).

#### Carbohydrates

Nomenclature of carbohydrates (*Pure Appl. Chem.*, 1996, **68**, 1919)

Nomenclature of glycolipids (*Pure Appl. Chem.*, 1997, **69**, 2475).

#### Carbon

Nomenclature and terminology of graphite intercalation compounds (*Pure Appl. Chem.*, 1994, **66**, 1893).

Recommended terminology for the description of carbon as a solid (*Pure Appl. Chem.*, 1995, **67**, 473).

#### Class Names

Glossary of class names of organic compounds and reactive intermediates based on structure (*Pure Appl. Chem.*, 1995, **67**, 1307).

#### Delta Convention

Nomenclature for cyclic organic compounds with contiguous formal double bonds (*Pure Appl. Chem.*, 1988, **60**, 1395)

#### Elements

Names and symbols of transfermium elements (*Pure Appl. Chem.*, 1997, **69**, 2471)

Naming of new elements (*Pure Appl. Chem.*, 2002, **74**, 787)

Name and symbol of the element with atomic number 110 (*Pure Appl. Chem.*, 2003, **75**, 1613)

#### Enzymes

**Enzyme Nomenclature** (1992), published by Academic Press in hardcover and softcover editions

#### Fullerenes

Nomenclature and terminology of fullerenes: a preliminary study (*Pure Appl. Chem.*, 1997, **69**, 1411).

Nomenclature for the C<sub>60</sub>-I<sub>h</sub> and C<sub>70</sub>-D<sub>5h(6)</sub> fullerenes (*Pure Appl. Chem.*, 2002, **74**, 629)

#### Hydrogen

Names for hydrogen atoms, ions and groups, and for reactions involving them (*Pure Appl. Chem.*, 1988, **60**, 1115).

Names for muonium and hydrogen atoms and their ions (*Pure Appl. Chem.*, 2001, **73**, 377)

#### Lambda Convention

Treatment of variable valence in organic nomenclature (*Pure Appl. Chem.*, 1984, **56**, 769)

#### Lignans

Nomenclature of lignans and neolignans (*Pure Appl. Chem.*, 2000, **72**, 1493)

#### Natural Products

Revised Section F: natural products and related compounds (*Pure Appl. Chem.*, 1999, **71**, 587)

#### Numerical Terms

Extension of Rules A-1.1 and A-2.5 concerning numerical terms used in organic chemical nomenclature (*Pure Appl. Chem.*, 1986, **58**, 1693)

#### Organic Rings

Revision of the extended Hantzsch-Widman system of nomenclature for heteromonocycles (*Pure Appl. Chem.*, 1983, **55**, 409)

Nomenclature of fused and bridged fused ring systems (*Pure Appl. Chem.*, 1998, **70**, 143)

Extension and revision of the von Baeyer system for naming polycyclic compounds (including bicyclic compounds) (*Pure Appl. Chem.*, 1999, **71**, 513)

Extension and revision of the nomenclature for spiro compounds (*Pure Appl. Chem.*, 1999, **71**, 531)

#### Organometallic Chemistry

Nomenclature of organometallic compounds of the transition elements (*Pure Appl. Chem.*, 1999, **71**, 1557)

#### Phanes

Phane nomenclature—I. Phane parent names (*Pure Appl. Chem.*, 1998, **70**, 1513)

Phane nomenclature. Part II. Modification of the degree of hydrogenation and substitution derivatives of phane parent hydrides (*Pure Appl. Chem.*, 2002, **74**, 809)

#### Polymers

Nomenclature of regular double-strand (ladder and spiro)

organic polymers (*Pure Appl. Chem.*, 1993, **65**, 1561).  
Structure-based nomenclature for irregular single-strand organic polymers (*Pure Appl. Chem.*, 1994, **66**, 873).  
Source-based nomenclature for non-linear macromolecules and macromolecular assemblies (*Pure Appl. Chem.*, 1997, **69**, 2511).  
Generic source-based nomenclature for polymers (*Pure Appl. Chem.* 2001, **73**, 1511; errata *Pure Appl. Chem.* 2002, **74**, 2019)  
Nomenclature of regular single-strand organic polymers (*Pure Appl. Chem.*, 2002, **74**, 1921)  
Graphic representations (chemical formulae) of macromolecules (*Pure Appl. Chem.*, 1994, **66**, 2469).  
*Radicals and Ions*  
Revised nomenclature for radicals, ions, radical ions and related species (*Pure Appl. Chem.*, 1993, **65**, 1357)  
Names for inorganic radicals (*Pure Appl. Chem.*, 2000, **72**, 437)  
*Zeolites*  
Chemical nomenclature and formulation of compositions of synthetic and natural zeolites (*Pure Appl. Chem.*, 1979, **51**, 1091).

## 2.2 Terminology, Symbols and Units, and Presentation of Results

### Analytical Chemistry

Classification and use of terms for amplification and related reactions (*Pure Appl. Chem.*, 1999, **71**, 1331)  
Guidelines for terms related to chemical speciation and fractionation of trace elements (*Pure Appl. Chem.*, 2000, **72**, 1453)  
Selectivity in analytical chemistry (*Pure Appl. Chem.*, 2001, **73**, 1381)  
Use of the terms “recovery” and “apparent recovery” in analytical procedures (*Pure Appl. Chem.*, 2002, **74**, 2201)

### Atmospheric Chemistry

Glossary of atmospheric chemistry terms (*Pure Appl. Chem.*, 1990, **62**, 2167).  
Units for use in atmospheric chemistry (*Pure Appl. Chem.*, 1995, **67**, 1377).

### Bioinorganic Chemistry

Glossary of terms used in bioinorganic chemistry (*Pure Appl. Chem.*, 1997, **69**, 1251)

### Biotechnology

Glossary for chemists of terms used in biotechnology (*Pure Appl. Chem.*, 1992, **64**, 143).  
Selection of terms, symbols and units related to microbial processes (*Pure Appl. Chem.*, 1992, **64**, 1047).

### Chromatography

Retention parameters in chromatography (*Pure Appl. Chem.*, 2001, **73**, 969)

### Clinical

Physicochemical quantities and units in clinical chemistry with special emphasis on activities and activity coefficients (*Pure Appl. Chem.*, 1984, **56**, 567).  
Glossary of terms in quantities and units in clinical chemistry (*Pure Appl. Chem.*, 1996, **68**, 957).  
Quantities and units in clinical chemistry: nebulizer and flame properties in flame emission and absorption spectrometry (*Pure Appl. Chem.*, 1986, **58**, 1737).  
List of quantities in clinical chemistry (*Pure Appl. Chem.*, 1979, **51**, 2481).  
Proposals for the description and measurement of carry-over effects in clinical chemistry (*Pure Appl. Chem.*, 1991, **63**, 301).  
Quantities and units for metabolic processes as a function of time (*Pure Appl. Chem.*, 1992, **64**, 1569).  
Quantities and units for electrophoresis in the clinical laboratory (*Pure Appl. Chem.*, 1994, **66**, 891).  
Quantities and units for centrifugation in the clinical laboratory (*Pure Appl. Chem.*, 1994, **66**, 897).

### Colloids and Surface Chemistry

Definitions, terminology and symbols in colloid and surface

chemistry. I (*Pure Appl. Chem.*, 1972, **31**, 577). II, Heterogeneous catalysis (*Pure Appl. Chem.*, 1976, **46**, 71). Part 1.14: Light scattering (provisional) (*Pure Appl. Chem.*, 1983, **55**, 931).  
Reporting experimental pressure–area data with film balances (*Pure Appl. Chem.*, 1985, **57**, 621).  
Reporting physisorption data for gas/solid systems with special reference to the determination of surface area and porosity (*Pure Appl. Chem.*, 1985, **57**, 603).  
Reporting data on adsorption from solution at the solid/solution interface (*Pure Appl. Chem.*, 1986, **58**, 967).  
Manual on catalyst characterization (*Pure Appl. Chem.*, 1991, **63**, 1227).  
Thin films including layers: terminology in relation to their preparation and characterization (*Pure Appl. Chem.*, 1994, **66**, 1667).  
Terminology for membranes and membrane processes (*Pure Appl. Chem.*, 1996, **68**, 1479).  
*Combinatorial Chemistry*  
Glossary of terms used in combinatorial chemistry (*Pure Appl. Chem.*, 1999, **71**, 2349)  
*Computational Chemistry*  
Glossary of terms used in computational drug design (*Pure Appl. Chem.*, 1997, **69**, 1137)  
Guidelines for presentation of methodological choices in the publication of computational results—A. *Ab initio* electronic structure calculations (*Pure Appl. Chem.*, 1998, **70**, 993).  
*Electrochemistry*  
Nomenclature for transfer phenomena in electrolytic systems (*Pure Appl. Chem.*, 1981, **53**, 1827).  
Electrode reaction orders, transfer coefficients and rate constants—amplification of definitions and recommendations for publication of parameters (*Pure Appl. Chem.*, 1980, **52**, 233).  
Classification and nomenclature of electroanalytical techniques (*Pure Appl. Chem.*, 1976, **45**, 81).  
Recommendations for sign conventions and plotting of electrochemical data (*Pure Appl. Chem.*, 1976, **45**, 131).  
Electrochemical nomenclature (*Pure Appl. Chem.*, 1974, **37**, 499).  
Recommendations on reporting electrode potentials in non-aqueous solvents (*Pure Appl. Chem.*, 1984, **56**, 461).  
Measurement of pH. Definition, standards and procedures (*Pure Appl. Chem.*, 2002, **74**, 2169)  
Interphases in systems of conducting phases (*Pure Appl. Chem.*, 1986, **58**, 437).  
The absolute electrode potential: an explanatory note (*Pure Appl. Chem.*, 1986, **58**, 955).  
Electrochemical corrosion nomenclature (*Pure Appl. Chem.*, 1989, **61**, 19).  
Terminology in semiconductor electrochemistry and photo-electrochemical energy conversion (*Pure Appl. Chem.*, 1991, **63**, 569).  
Nomenclature, symbols, definitions and measurements for electrified interfaces in aqueous dispersions of solids (*Pure Appl. Chem.*, 1991, **63**, 895).  
Nomenclature, symbols and definitions in electrochemical engineering (*Pure Appl. Chem.*, 1993, **65**, 1009).  
Terminology and conventions for microelectronic ion-selective field effect transistor devices in electrochemistry (*Pure Appl. Chem.*, 1994, **66**, 565).  
Impedances of electrochemical systems: terminology, nomenclature and representation—Part 1: Cells with metal electrodes and liquid solutions (*Pure Appl. Chem.*, 1994, **66**, 1831).  
Terminology and notations for multistep electrochemical reaction mechanisms (*Pure Appl. Chem.*, 1994, **66**, 2445).  
Recommendations for nomenclature of ion-selective electrodes (*Pure Appl. Chem.*, 1993, **65**, 2641).  
Chemically modified electrodes: recommended terminology and definitions (*Pure Appl. Chem.*, 1997, **69**, 1317).

### *Kinetics*

A glossary of terms used in chemical kinetics, including reaction dynamics (*Pure Appl. Chem.*, 1996, **68**, 149). Kinetics of composite reactions in closed and open flow systems (*Pure Appl. Chem.*, 1993, **65**, 2641).

### *Liquid Crystals*

Definitions of basic terms relating to low-molar-mass and polymer liquid crystals (*Pure Appl. Chem.*, 2001, **73**, 845). Definitions of basic terms relating to polymer liquid crystals (*Pure Appl. Chem.*, 2002, **74**, 493).

### *Medicinal Chemistry*

Glossary of terms used in medicinal chemistry (*Pure Appl. Chem.*, 1998, **70**, 1129).

### *Pesticides*

Glossary of terms relating to pesticides (*Pure Appl. Chem.*, 1996, **68**, 1167).

### *Photochemistry*

Recommended standards for reporting photochemical data (*Pure Appl. Chem.*, 1984, **56**, 939).

Glossary of terms used in photochemistry (*Pure Appl. Chem.*, 1996, **68**, 2223).

### *Physical Organic Chemistry*

Glossary of terms used in physical organic chemistry (*Pure Appl. Chem.*, 1994, **66**, 1077).

### *Polymers*

Basic classification and definitions of polymerization reactions (*Pure Appl. Chem.*, 1994, **66**, 2483).

Glossary of basic terms in polymer science (*Pure Appl. Chem.*, 1996, **68**, 2287).

Definitions of terms relating to degradation, aging, and related chemical transformations of polymers (*Pure Appl. Chem.*, 1996, **68**, 2313).

Definition of terms relating to the non-ultimate mechanical properties of polymers (*Pure Appl. Chem.*, 1998, **70**, 701).

Definitions relating to stereochemically asymmetric polymerizations (*Pure Appl. Chem.*, 2002, **74**, 915).

### *Quantum Chemistry*

Expression of results in quantum chemistry (*Pure Appl. Chem.*, 1978, **50**, 75).

### *Reactions*

Nomenclature for organic chemical transformations (*Pure Appl. Chem.*, 1989, **61**, 725).

System for symbolic representation of reaction mechanisms (*Pure Appl. Chem.*, 1989, **61**, 23).

Detailed linear representation of reaction mechanisms (*Pure Appl. Chem.*, 1989, **61**, 57).

### *Rheological Properties*

Selected definitions, terminology and symbols for rheological properties (*Pure Appl. Chem.*, 1979, **51**, 1215).

### *Spectroscopy*

Recommendations for publication of papers on methods of molecular absorption spectrophotometry in solution (*Pure Appl. Chem.*, 1978, **50**, 237).

Recommendations for the presentation of infrared absorption spectra in data collections. A, Condensed phases (*Pure Appl. Chem.*, 1978, **50**, 231).

Definition and symbolism of molecular force constants (*Pure Appl. Chem.*, 1978, **50**, 1709).

Nomenclature and conventions for reporting Mössbauer spectroscopic data (*Pure Appl. Chem.*, 1976, **45**, 211).

Parameters and symbols for use in nuclear magnetic resonance (*Pure Appl. Chem.*, 1997, **69**, 2489).

Recommendations for the presentation of NMR structures of proteins and nucleic acids (*Pure Appl. Chem.*, 1998, **70**, 117).

Guidelines for the representation of pulse sequences for solution-state nuclear magnetic resonance spectrometry (*Pure Appl. Chem.*, 2001, **73**, 1749).

NMR nomenclature. Nuclear spin properties and conventions for chemical shifts (*Pure Appl. Chem.*, 2001, **73**, 1795).

Presentation of Raman spectra in data collections (*Pure Appl. Chem.*, 1981, **53**, 1879).

Names, symbols, definitions and units of quantities in optical spectroscopy (*Pure Appl. Chem.*, 1985, **57**, 105).

A descriptive classification of the electron spectroscopies (*Pure Appl. Chem.*, 1987, **59**, 1343).

Presentation of molecular parameter values for IR and Raman intensity (*Pure Appl. Chem.*, 1988, **60**, 1385).

Recommendations for EPR/ESR nomenclature and conventions for presenting experimental data in publications (*Pure Appl. Chem.*, 1989, **61**, 2195).

Recommendations for nomenclature and symbolism for mass spectroscopy (*Pure Appl. Chem.*, 1991, **63**, 1541).

Symbols for fine and hyperfine structure parameters (*Pure Appl. Chem.*, 1994, **66**, 571).

English-derived abbreviations for experimental techniques in surface science and chemical spectroscopy (*Pure Appl. Chem.*, 1991, **63**, 887).

Symmetry, selection rules and nomenclature in surface spectroscopies (*Pure Appl. Chem.*, 1996, **68**, 457).

Notations and conventions in molecular spectroscopy: 1.

General spectroscopic notation (*Pure Appl. Chem.*, 1997, **69**, 1633); 2. Symmetry notation (*Pure Appl. Chem.*, 1997, **69**,

1641); 3. Permutation and permutation-inversion symmetry notation (*Pure Appl. Chem.*, 1997, **69**, 1651).

Nomenclature, symbols, units and their usage in spectrochemical analysis— XVI. Luminescence (*Pure Appl. Chem.*, 1997, **69**, 1435); XVII. Laser-based molecular spectrometry for chemical analysis: absorption (*Pure Appl. Chem.*, 1999, **71**, 2189); XVIII. Raman scattering processes (*Pure Appl. Chem.*, 1997, **69**, 1451).

### *Solid State*

Definitions of terms relating to phase transitions of the solid state (*Pure Appl. Chem.*, 1994, **66**, 577).

Definitions of terms for diffusion in the solid state (*Pure Appl. Chem.*, 1999, **71**, 1307).

Nomenclature of structural and compositional characteristics of ordered microporous and mesoporous materials with inorganic hosts (*Pure Appl. Chem.*, 2001, **73**, 381).

### *Stereochemistry*

Basic terminology of stereochemistry (*Pure Appl. Chem.*, 1996, **68**, 2193).

### *Theoretical Chemistry*

Acronyms used in theoretical chemistry (*Pure Appl. Chem.*, 1996, **68**, 387).

Glossary of terms used in theoretical organic chemistry (*Pure Appl. Chem.*, 1999, **71**, 1919).

### *Thermodynamics*

A guide to procedures for the publication of thermodynamic data (*Pure Appl. Chem.*, 1972, **39**, 395).

Assignment and presentation of uncertainties of the numerical results of thermodynamic measurements (*Pure Appl. Chem.*, 1981, **53**, 1805).

Notation for states and processes; significance of the word 'standard' in chemical thermodynamics and remarks on commonly tabulated forms of thermodynamic functions (*Pure Appl. Chem.*, 1982, **54**, 1239).

Standard quantities in thermodynamics: fugacities, activities and equilibrium constants for pure and mixed phases (*Pure Appl. Chem.*, 1994, **66**, 533).

Recommendations for nomenclature and tables in biochemical thermodynamics (*Pure Appl. Chem.*, 1994, **66**, 1641).

### *Toxicology*

Glossary for chemists of terms used in toxicology (*Pure Appl. Chem.*, 1993, **65**, 2003).