

**Appendix I. Selected Journal Abbreviations****A**

*Acc. Chem. Res.*  
*Acta Chem. Scand., Ser. A/B*  
*Acta Crystallogr., Sect. A/B/C/D*  
*Adv. Mass Spectrom.*  
*Adv. X-Ray Anal.*  
*Agric. Biol. Chem.*  
*Anal. Biochem.*  
*Anal. Chem.*  
*Anal. Chim. Acta*  
*Angew. Chem.*  
*Angew. Chem., Int. Ed.*  
*Angew. Makromol. Chem.*  
*Ann. Chem. (Fr.)*  
*Ann. Chem. (Roma)*  
*Arzneim.-Forsch.*  
*Aust. J. Chem.*

**B**

*Ber. Bunsenges. Phys. Chem.*  
*Ber. Dtsch. Chem. Ges.*  
*Biochemistry*  
*Biochem. Biophys. Res. Commun.*  
*Biochem. J.*  
*Biochem. Pharmacol.*  
*Bull. Chem. Soc. Jpn.*  
*Bull. Soc. Chim. Belg.*  
*Bull. Soc. Chim. Fr.*

**C**

*Can. J. Biochem.*  
*Can. J. Chem.*  
*Carbohydr. Res.*  
*Chem. Abstr.*  
*Chem. Ber.*  
*Chem. Commun.*  
*Chem. Eng. News*  
*Chem. Eng. Sci.*  
*Chem. Eng. (N. Y.)*  
*Chem.-Eur. J.*  
*Chem. Ind. (London)*  
*Chem. Lett.*  
*Chem. Pharm. Bull.*  
*Chem. Phys.*  
*Chem. Phys. Lett.*  
*Chem. Rev.*  
*Chem. Soc. Rev.*  
*Chimia*  
*Collect. Czech. Chem. Commun.*  
*C. R. Acad. Sci., Ser. II/III*

**D**

*Dokl. Akad. Nauk SSSR*

**E**

*Electrochim. Acta*  
*Eur. J. Biochem.*  
*Eur. J. Inorg. Chem.*  
*Eur. J. Org. Chem.*  
*Eur. J. Pharmacol.*  
*Experientia*

**F**

*Fresenius' J. Anal. Chem.*

**G**

*Gazz. Chim. Ital.*

**H**

*Helv. Chim. Acta*  
*Heterocycles*

**I**

*Indian J. Chem., Sect. A/B*  
*Inorg. Chem.*  
*Inorg. Chim. Acta*  
*Inorg. Nucl. Chem. Lett.*  
*Int. J. Biochem.*  
*Int. J. Chem. Kinet.*  
*Int. J. Mass Spectrom. Ion Phys.*  
*Int. J. Pept. Protein Res.*  
*Int. J. Quantum Chem.*  
*Izv. Akad. Nauk SSSR, Ser. Khim.*

**J**

*J. Am. Chem. Soc.*  
*J. Antibiot.*  
*J. Appl. Chem. Biotechnol.*  
*J. Appl. Crystallogr.*  
*J. Appl. Electrochem.*  
*J. Biochem.*  
*J. Biol. Chem.*  
*J. Chem. Educ.*  
*J. Chem. Phys.*  
*J. Chem. Soc., Chem Commun.*  
*J. Chem. Soc., Dalton Trans.*  
*J. Chem. Soc., Faraday Trans. 1/2*  
*J. Chem. Soc., Perkin Trans. 1/2*  
*J. Chem. Thermodyn.*  
*J. Chromatogr.*  
*J. Chromatogr. Sci.*  
*J. Electrochem. Soc.*  
*J. Electron Spectrosc. Relat. Phenom.*  
*J. Fluorine Chem.*  
*J. Heterocycl. Chem.*  
*J. Lipid Res.*

*J. Liq. Chromatogr.*  
*J. Magn. Reson.*  
*J. Med. Chem.*  
*J. Mol. Spectrosc.*  
*J. Organomet. Chem.*  
*J. Org. Chem.*  
*J. Pharm. Pharmacol.*  
*J. Pharm. Sci.*  
*J. Photochem.*  
*J. Phys. Chem.*  
*J. Prakt. Chem.*  
*J. Radioanal. Chem.*  
*J. Solid State Chem.*  
*J. Solution Chem.*  
*J. Steroid Biochem.*  
*Jpn. J. Antibiot.*  
*Jpn. J. Pharmacol.*

**K**

*Khim. Prir. Soedin.*

**L**

*Liebigs Ann. Chem.*  
*Lipids*

**M**

*Microchem. J.*  
*Microchim. Acta*  
*Mol. Pharmacol.*  
*Mol. Phys.*  
*Monatsh. Chem.*

**N**

*Nature (London)*  
*Naturwissenschaften*  
*Nouv. J. Chim.*  
*Nucleic Acids Res.*

**O**

*Org. Magn. Reson.*  
*Org. Mass Spectrom.*

**P**

*Pharmacology*  
*Pharmacol. Res. Commun.*

*Photochem. Photobiol.*  
*Phytochemistry*  
*Planta Med.*  
*Polym. J.*  
*Pol. J. Chem.*  
*Proc. Anal. Div. Chem. Soc.*  
*Proc. Natl. Acad. Sci. U.S.A.*  
*Pure Appl. Chem.*

**R**

*Radiat. Phys. Chem.*  
*Recl. Trav. Chim. Pays-Bas*

**S**

*Science*  
*Spectrochim. Acta, Part A/B*  
*Synthesis*  
*Synth. Commun.*  
*Synth. Lett.*

**T**

*Talanta*  
*Tetrahedron*  
*Tetrahedron Lett.*  
*Theor. Chim. Acta*  
*Topics Curr. Chem.*

**V**

*Vitamins*

**Y**

*Yakugaku Zasshi*

**Z**

*Z. Anorg. Allg. Chem.*  
*Z. Kristallogr., Kristalloggeom., Kristallphys.,  
Kristallchem.*  
*Z. Naturforsch., A/B/C*  
*Z. Phys. Chem. (Leipzig)*  
*Z. Phys. Chem. (Wiesbaden)*  
*Zh. Neorg. Khim.*  
*Zh. Obshch. Khim.*  
*Zh. Org. Khim.*

**Appendix II. IUPAC Recommendations on Nomenclature, Symbols, and Terminology****I. Nomenclature of Organic Chemistry**

1. 'Nomenclature of Organic Chemistry, Sections A, B, C, D, E, F, and H; 1979 Edition' (The 'Blue Book'), IUPAC, Pergamon Press, Oxford, 1979.
2. 'A Guide to IUPAC Nomenclature of Organic Compounds, Recommendations 1993', Blackwell Scientific Publications, Oxford – London – Edinburgh – Boston – Melbourne – Paris – Berlin – Vienna.
3. 'Extension of Rules A-1.1 and A-2.5 Concerning Numerical Terms Used in Organic Chemical Nomenclature (Provisional)', *Pure Appl. Chem.* **1983**, 55, 1463.
4. 'Revision of the Extended Hantzsch-Widman System of Nomenclature for Heteromonocycles', *Pure Appl. Chem.* **1983**, 55, 409.
5. 'Treatment of Variable Valence in Organic Nomenclature (Lambda Conventions) (Recommendations 1983)', *Pure Appl. Chem.* **1984**, 56, 769.
6. 'Glossary of Terms Used in Physical Organic Chemistry', *Pure Appl. Chem.* **1983**, 55, 1281.
7. 'Nomenclature for Straightforward Transformations (Provisional)', *Pure Appl. Chem.* **1981**, 53, 305.
8. 'Extension of Rules A-1.1 and A-2.5 Concerning Numerical Terms Used in Organic Chemical Nomenclature', *Pure Appl. Chem.* **1986**, 58, 1693.
9. 'Glossary of Terms Used in Photochemistry (Recommendations 1988)', *Pure Appl. Chem.* **1988**, 60, 1055.
10. 'Names for Hydrogen Atoms, Ions, and Groups, and Reactions Involving Them (Recommendations 1988)', *Pure Appl. Chem.* **1988**, 60, 1115.
11. 'Nomenclature for Cyclic Organic Compounds with Contiguous Formal Double Bonds (the  $\delta$ -Convention) (Recommendations 1988)', *Pure Appl. Chem.* **1988**, 60, 1395.
12. 'System for Symbolic Representation of Reaction Mechanisms (Recommendations 1988)', *Pure Appl. Chem.* **1989**, 61, 23.
13. 'Nomenclature for Organic Chemical Transformations (Recommendations 1988)', *Pure Appl. Chem.* **1989**, 61, 725.
14. 'Biotransformation – a Useful Tool in Organic Chemistry', *Pure Appl. Chem.* **1990**, 62, 753.
15. 'Revised Nomenclature for Radicals, Ions, Radical Ions, and Related Species (Recommendations 1993)', *Pure Appl. Chem.* **1993**, 65, 1357.
16. 'Glossary of Terms Used in Physical Organic Chemistry (Recommendations 1994)', *Pure Appl. Chem.* **1994**, 66, 1077.
17. 'Glossary of Class Names of Organic Compounds and Reactive Intermediates Based on Structure (Recommendations 1995)', *Pure Appl. Chem.* **1995**, 67, 1307.
18. 'Nomenclature and Terminology of Fullerenes: A Preliminary Survey', *Pure Appl. Chem.* **1997**, 69, 1411.
19. 'Nomenclature of Fused and Bridged Fused Ring Systems (Recommendations 1998)', *Pure Appl. Chem.* **1998**, 70, 144.
20. 'Extension and Revision of the von Baeyer System for Naming Polycyclic Compounds (Including Bicyclic Compounds) (Recommendations 1999)', *Pure Appl. Chem.* **1999**, 71, 513.
21. 'Extension and Revision of the Nomenclature for Spiro Compounds (Recommendations 1999)', *Pure Appl. Chem.* **1999**, 71, 531.
22. 'Revised Section F: Natural Products and Related Compounds (Recommendations 1999)', *Pure Appl. Chem.* **1999**, 71, 587.
23. 'Corrections to *A Guide to IUPAC Nomenclature of Organic Compounds* (Recommendations 1993)', *Pure Appl. Chem.* **1999**, 71, 1327.
24. 'Glossary of Terms Used in Theoretical Organic Chemistry (Recommendations 1999)', *Pure Appl. Chem.* **1999**, 71, 1919.
25. 'Nomenclature for the  $C_{60}$ - $I_h$  and  $C_{70}$ - $D_{5h(6)}$  Fullerenes (Recommendations 2002)', *Pure Appl. Chem.* **2002**, 74, 629.
26. 'Phane Nomenclature. Part I: Phane Parent Names (Recommendations 1998)', *Pure Appl. Chem.* **1998**, 70, 1513.
27. 'Phane Nomenclature. Part II: Modification of the Degree of Hydrogenation and Substitution Derivatives of Phane Parent Hydrides (Recommendations 2002)', *Pure Appl. Chem.* **2002**, 74, 809.

**II. Biochemical Nomenclature**

1. 'Biochemical Nomenclature and Related Documents'; A Compendium, 2nd Edition, International Union of Biochemistry and Molecular Biology, Portland Press, London – Chapel Hill, 1992.
2. 'Nomenclature and Symbolism for Amino Acids Peptides (Recommendations 1983)', *Pure Appl. Chem.* **1984**, 56, 595.

3. 'Abbreviated Nomenclature of Synthetic Polypeptides (Polymerized Amino Acids)', *Pure Appl. Chem.* **1973**, 33, 437
4. 'Abbreviations and Symbols for Description of Conformation of Polypeptide Chains (Rules Approved 1974)', *Pure Appl. Chem.* **1974**, 40, 291.
5. 'Nomenclature of Carbohydrates (Recommendations 1996)', *Pure Appl. Chem.* **1996**, 82, 1919.
6. 'Nomenclature of Unsaturated Monosaccharides (Provisional)', *Pure Appl. Chem.* **1982**, 54, 207.
7. 'Nomenclature of Branched-Chain Monosaccharides (Provisional)', *Pure Appl. Chem.* **1982**, 54, 211.
8. 'Conformational Nomenclature for Five- and Six-Membered Ring Formes of Monosaccharides and their Derivatives (Provisional)', *Pure Appl. Chem.* **1982**, 53, 1901.
9. 'Polysaccharide Nomenclature (Provisional)', *Pure Appl. Chem.* **1982**, 54, 1517.
10. 'Abbreviated Terminology of Oligosaccharide Chains (Provisional)', *Pure Appl. Chem.* **1982**, 54, 1517.
11. 'Symbols for Specifying the Conformation of Polysaccharide Chains (Provisional)', *Pure Appl. Chem.* **1983**, 55, 1269.
12. 'Nomenclature of Cyclitols', *Pure Appl. Chem.* **1974**, 37, 283.
13. 'Abbreviations and Symbols for Nucleic Acids, Polynucleotides, and their Constituents (Rules Approved 1974)', *Pure Appl. Chem.* **1974**, 40, 277.
14. 'Abbreviations and Symbols for the Description of Conformations Polynucleotide Chains (Provisional)', *Pure Appl. Chem.* **1983**, 55, 1296.
15. 'Nomenclature of Tetrapyrroles (Recommendations 1986)', *Pure Appl. Chem.* **1987**, 59, 779.
16. 'Nomenclature of Corrinoids', *Pure Appl. Chem.* **1976**, 48, 459.
17. 'Nomenclature of Steroids (Recommendations 1989)', *Pure Appl. Chem.* **1989**, 61, 1783.
18. 'Nomenclature of Carotenoids (Rules Approved 1974)', *Pure Appl. Chem.* **1975**, 41, 405.
19. 'Nomenclature of Retinoids (Provisional)', *Pure Appl. Chem.* **1983**, 55, 721.
20. 'Nomenclature of Tocopherols and Related Compounds', *Pure Appl. Chem.* **1982**, 54, 1507.
21. 'Nomenclature of Vitamin D (Provisional)', *Pure Appl. Chem.* **1982**, 54, 1511.
22. 'Nomenclature of Quinones with Isoprenoid Side-Chains (Rules 1973)', *Pure Appl. Chem.* **1974**, 38, 439.
23. 'Definitive Nomenclature for Vitamin B-6 and Related Compounds', *Pure Appl. Chem.* **1973**, 33, 445.
24. 'Nomenclature of Iron-Sulfur Proteins (Recommendations 1978)', *Eur. J. Biochem.* **1979**, 93, 427; Corrections, *ibid.* **1979**, 95, 369 and 102, 315.
25. 'Enzyme Nomenclature Recommendations 1978', Academic Press, New York, 1979; 'Supplement 1. Corrections and Additions', *Eur. J. Biochem.* **1980**, 104, 1; 'Supplement 2. Corrections and Additions'. *Eur. J. Biochem.* **1981**, 116, 423.
26. 'Multienzyme Proteins', *Trends Biochem. Sci.* **1979**, 4, N275.
27. 'The Nomenclature of Multiple Forms of Enzymes (Recommendations 1976)', *Eur. J. Biochem.* **1978**, 82, 1.
28. 'Generic Descriptors and Trivial Names for Vitamins and Related Compounds (Recommendations 1976)' *Nutrition Abstr. and Revs.*, Series A: *Human and Experimental* **1978**, 48, 831.
29. 'Nomenclature of Phosphorus-Containing Compounds of Biochemical Importance (Recommendations 1976)', *Eur. J. Biochem.* **1977**, 79, 1.
30. 'Nomenclature of Peptide Hormones (Recommendations 1978)', *Biochemistry* **1975**, 14, 2559.
31. 'The Nomenclature of Lipids (Recommendations 1976)', *Eur. J. Biochem.* **1977**, 79, 11.
32. 'Nomenclatures and Symbols for Folic Acid and Related Compounds, Tentative Rules', *J. Biol. Chem.* **1966**, 241, 2991.
33. 'Abbreviations and Symbols for Chemical Names of Special Interest in Biological Chemistry Revised Tentative Rules (1965)', *Biochemistry* **1966**, 5, 1445.
34. 'Abbreviations and Symbols'. *Eur. J. Biochem.* **1977**, 79, 11.
35. 'List of Symbols with Units Recommended for Use in Biotechnology (Provisional)', *Pure Appl. Chem.* **1982**, 54, 1743.
36. 'Physicochemical Quantities and Units in Clinical Chemistry with Special Emphasis on Activities and Activity Coefficients (Recommendations 1986)', *Pure Appl. Chem.* **1984**, 56, 567.
37. 'Nomenclature of Prenols (Recommendations 1986)', *Pure Appl. Chem.* **1987**, 59, 683.
38. 'Nomenclature and Symbols for Folic Acid and Related Compounds (Recommendations 1986) *Pure Appl. Chem.* **1987**, 59, 833.
39. 'Nomenclature of Glycoproteins, Glycoproteins and Peptidoglycans Recommendations 1985', *Pure Appl. Chem.* **1988**, 60, 1389.
40. 'Recommendations for Nomenclature and Tables in Biochemical Thermodynamics (Recommendations 1994)', *Pure Appl. Chem.* **1994**, 66, 1641.

41. 'Nomenclature of Lignans and Neolignans (Recommendations 2000)', *Pure Appl. Chem.* **2000**, 72, 1493.

### III. Nomenclature of Inorganic Chemistry, Analytical Nomenclature, and Electrochemistry

#### *Inorganic Chemistry*

1. 'Nomenclature of Inorganic Chemistry, Recommendations 1990' (The 'Red Book'), Blackwell Scientific Publications, Oxford – London – Edinburgh – Boston – Melbourne, 1990.
2. 'How to Name an Inorganic Substance. A Guide to the Use of Nomenclature of Inorganic Chemistry, 2nd ed., 1971' Pergamon Press, New York, 1977.
3. 'Nomenclature of Inorganic Chemistry, II. 1. Isotopically Modified Compounds (Recommendations 1981)', *Pure Appl. Chem.* **1981**, 53, 1887.
4. 'Nomenclature of Inorganic Chemistry, II. 2. The Nomenclature of Hydrides of Nitrogen and Derived Cations, Anions and Ligands', *Pure Appl. Chem.* **1982**, 54, 2545.
5. 'Nomenclature of Inorganic Boron Compounds', *Pure Appl. Chem.* **1972**, 30, 681.
6. 'Recommendations for the Naming of Elements of Atomic Numbers Greater than 100', *Pure Appl. Chem.* **1979**, 51, 381.
7. 'Element by Element Review of their Atomic Weights.', *Pure Appl. Chem.* **1984**, 56, 695.
8. 'New Notations in the Periodic Table', *Pure Appl. Chem.* **1988**, 60, 431.
9. 'Atomic Weights of the Elements 1993', *Pure Appl. Chem.* **1994**, 66, 2423.
10. 'Glossary of Terms Used in Bioinorganic Chemistry (Recommendations 1997)', *Pure Appl. Chem.* **1997**, 69, 1251.
11. 'Nomenclature of Inorganic Chains and Ring Compounds (Recommendation 1997)', *Pure Appl. Chem.* **1997**, 69, 1659.
12. 'Isotopic Composition of the Elements', *Pure Appl. Chem.* **1998**, 70, 217.
13. 'Names for Inorganic Radicals (Recommendations 2000)', *Pure Appl. Chem.* **2000**, 72, 473.
14. 'Terminology for Compounds in the Si-Al-O-N System (Recommendations 1999)', *Pure Appl. Chem.* **1999**, 71, 1765.
15. 'Naming of new Elements (Recommendations 2002)', *Pure Appl. Chem.* **2002**, 74, 787.

#### *Analytical Nomenclature*

1. 'Compendium of Analytical Nomenclature (Definitive Rules 1977)', IUPAC, Pergamon Press, Oxford, 1978.
2. 'Nomenclature for Thermal Analysis IV (Provisional)', *Pure Appl. Chem.* **1981**, 53, 1597.
3. 'Recommendations for Publishing Manuscripts on Ion-Selective Electrodes', *Pure Appl. Chem.* **1981**, 53, 1907.
4. 'Recommendation for Publication of Papers on Precipitation Methods of Gravimetric Analysis', *Pure Appl. Chem.* **1981**, 53, 2303.
5. 'Nomenclature for Thermal Analysis II and III', *Pure Appl. Chem.* **1980**, 52, 2385.
6. 'Recommended Nomenclature for Scales of Working in Analysis', *Pure Appl. Chem.* **1979**, 51, 43.
7. 'Guide to Trivial Names, Trade Names, and Synonyms for Substances Used in Analytical Nomenclature', *Pure Appl. Chem.* **1978**, 50, 339.
8. 'Recommendations on the Usage of the Terms 'Equivalent' and 'Normal'', *Pure Appl. Chem.* **1978**, 50, 325.
9. 'Recommendations for Nomenclature of Ion-Selective Electrodes', *Pure Appl. Chem.* **1976**, 48, 127.
10. 'Proposed Terminology and Symbols for the Transfer of Solutes from One Solvent to Another', *Pure Appl. Chem.* **1978**, 50, 589.
11. 'Recommended Nomenclature for Titrimetric Analysis', *Pure Appl. Chem.* **1969**, 18, 427.
12. 'Recommendations for the Presentation of the Results of Chemical Analysis', *Pure Appl. Chem.* **1969**, 18, 437.
13. 'Recommended Symbols for Solution Equilibria', *Pure Appl. Chem.* **1969**, 18, 457.
14. 'Recommended Nomenclature for Liquid-Liquid Distribution', *Pure Appl. Chem.* **1970**, 21, 109.
15. 'Recommended Nomenclature for Automatic Analysis', *Pure Appl. Chem.* **1970**, 21, 527.
16. 'Recommendations on Ion-Exchange Nomenclature', *Pure Appl. Chem.* **1972**, 29, 617.
17. 'Nomenclature for Chromatography (Recommendations 1993)', *Pure Appl. Chem.* **1993**, 65, 819.
18. 'Recommendations on Nomenclature for Contamination Phenomena in Precipitation from Aqueous Solutions', *Pure Appl. Chem.* **1974**, 37, 463.
19. 'Recommendations on Nomenclature for Thermal Analysis (Rules 1972)', *Pure Appl. Chem.* **1974**, 37, 439.
20. 'Recommendations for the Usage of Selective, Selectivity, and Related Terms in Analytical Chemistry', *Pure Appl. Chem.* **1984**, 55, 553.
21. 'Recommendations on the Use of the Term Amplification Reactions', *Pure Appl. Chem.* **1982**, 54, 2553.
22. 'Recommendations for Publication of Papers on a New Analytical Method Based on Ion Exchange or Ion-Exchange Chromatography', *Pure Appl. Chem.* **1980**, 52, 2553.

23. 'Recommendations for Presentation of Data on Compleximetric Indicators, I. General', *Pure Appl. Chem.* **1979**, *51*, 1357.
24. 'Glossary of Terms Used in Nuclear Analytical Chemistry (Provisional)', *Pure Appl. Chem.* **1982**, *54*, 1533.
25. 'Nomenclature, Symbols, and Units Recommended for *in-situ* Microanalysis (Provisional)', *Pure Appl. Chem.* **1983**, *55*, 2023.
26. 'General Aspects of Trace Analytical Methods. IV. Recommendations for Nomenclature, Standard Procedures, and Reporting of Experimental Data for Surface Analysis Techniques', *Pure Appl. Chem.* **1979**, *51*, 2243.
27. 'Definition of pH Scales, Standard Reference Values, Measurement of pH and Related Technology (Recommendations 1984)', **1985**, *57*, 531.
28. 'Thermodynamic Functions of Transfer of Single Ions from Water to Nonaqueous and Mixed Solvents. Part 2. Enthalpies and Entropies of Transfer to Nonaqueous Solvents', *Pure Appl. Chem.* **1985**, *57*, 1103.
29. 'Thermodynamic Functions of Transfer of Single Ions from Water to Nonaqueous and Mixed Solvents. Part 3. Standard Potentials of Selected Electrodes', *Pure Appl. Chem.* **1985**, *57*, 1129.
30. 'Definition and Determination of Response Time of Ion Selective Electrodes', *Pure Appl. Chem.* **1986**, *58*, 469.
31. 'Characteristics of Liquid Stationary Phases and Column Evaluation for Gas Chromatography', *Pure Appl. Chem.* **1986**, *58*, 1291.
32. 'Nomenclature for Automated and Mechanised Analysis (Recommendations 1989)', *Pure Appl. Chem.* **1989**, *61*, 1657.
33. 'Recommended Methods for the Purification of Solvents and Tests for Impurities: 1-Propanol, 2-Propanol, and 2-Methyl-2-propanol', *Pure Appl. Chem.* **1986**, *58*, 1411.
34. 'Recommended Methods for Purification of Solvents and Tests for Impurities: Acetone', *Pure Appl. Chem.* **1986**, *58*, 1353.
35. 'Recommended Methods for Purification of Solvents and Tests for Impurities: Nitromethane', *Pure Appl. Chem.* **1986**, *58*, 1541.
36. 'Reference Materials for Fluorescence Measurements', *Pure Appl. Chem.* **1988**, *60*, 1107.
37. 'Molecular Absorption Spectroscopy, Ultraviolet and Visible (UV/VIS) (Recommendations 1988)', *Pure Appl. Chem.* **1988**, *60*, 1449.
38. 'Nomenclature for Sampling and Analytical Chemistry (Recommendations 1990)', *Pure Appl. Chem.* **1990**, *62*, 1193.
39. 'Gibbs Energies of Transfer into Aqueous Alcohols', *Pure Appl. Chem.* **1990**, *62*, 899.
40. 'Total Half-lives for Selected Nuclides', *Pure Appl. Chem.* **1990**, *62*, 941.
41. 'Nomenclature of Kinetic Methods of Analysis (Recommendations 1993)', *Pure Appl. Chem.* **1993**, *65*, 2291.
42. 'Nomenclature in Evaluation of Analytical Methods Including Detection and Quantification Capabilities (Recommendations 1995)', *Pure Appl. Chem.* **1995**, *67*, 1699.
43. 'Nomenclature of Non-linear Chromatography (Recommendations 1996)', *Pure Appl. Chem.* **1996**, *68*, 1591.
44. 'Selectivity in Analytical Chemistry (Recommendations 2001)', *Pure Appl. Chem.* **2001**, *73*, 1381.

#### *Electrochemistry*

1. 'Electrochemical Nomenclature', *Pure Appl. Chem.* **1974**, *37*, 499.
2. 'Recommendations on Reporting Electrode Potentials in Nonaqueous Solvents (Recommendations 1983)', *Pure Appl. Chem.* **1984**, *56*, 461.
3. 'Nomenclature for Transport Phenomena in Electrolytic Systems', *Pure Appl. Chem.* **1981**, *53*, 1827.
4. 'Electrode Reaction Orders, Transfer Coefficients, and Rate Constants. Amplification of Definitions and Recommendations for Publication of Parameters', *Pure Appl. Chem.* **1980**, *52*, 233.
5. 'Classification and Nomenclature of Electroanalytical Techniques', *Pure Appl. Chem.* **1976**, *48*, 81.
6. 'Recommendations for Sign Conventions and Plotting of Electrochemical Data', *Pure Appl. Chem.* **1976**, *48*, 131.
7. 'Recommended Terms, Symbols, and Definitions for Electroanalytical Chemistry (Recommendations 1985)', *Pure Appl. Chem.* **1985**, *57*, 1491.
8. 'Proposed Terminology and Symbols for the Quantity Representing the Transfer of Solutes from One Solvent to Another', *Pure Appl. Chem.* **1978**, *50*, 587.
9. 'Standard Potentials of Amalgam Electrodes in Aqueous Solutions, Temperature Coefficients and Activity Coefficients of Metals in Mercury', *Pure Appl. Chem.* **1985**, *57*, 169.
10. 'Interphases in Systems of Conducting Phases (Recommendations 1985)', *Pure Appl. Chem.* **1986**, *58*, 437.

11. 'The Absolute Electrode Potential: An Explanatory Note (Recommendations 1986)', *Pure Appl. Chem.* **1986**, 58, 955.
12. 'Electrochemical Corrosion Nomenclature (Recommendations 1988)', *Pure Appl. Chem.* **1989**, 61, 19.
13. 'Terminology in Semiconductor Electrochemistry and Photoelectrochemical Energy Conversion (Recommendation 1991)', *Pure Appl. Chem.* **1991**, 63, 569.
14. 'Terminology and Notations for Multistep Electrochemical Reaction Mechanisms (Recommendations 1994)', *Pure Appl. Chem.* **1994**, 66, 2445.
15. 'Recommendations for Nomenclature of Ion-Selective Electrodes (Recommendations 1994)', *Pure Appl. Chem.* **1994**, 66, 2527.

#### IV. Physical Chemistry

1. 'Manual of Symbols and Terminology for Physicochemical Quantities and Units (1979 Edition)', *Pure Appl. Chem.* **1979**, 51, 1.
2. 'Manual of Symbols and Terminology for Physicochemical Quantities and Units. Appendix IV. Notation of States and Processes, Significance of the 'Standard' in Chemical Thermodynamics', and Remarks on Commonly Tabulated Forms of Thermodynamic Functions', *Pure Appl. Chem.* **1982**, 54, 1239.
3. 'A Guide to Procedures for the Publication of Thermodynamic Data', *Pure Appl. Chem.* **1972**, 29, 395.
4. 'Assignment and Presentation of Uncertainties of Numerical Results of Thermodynamic Measurements (Provisional)', *Pure Appl. Chem.* **1981**, 53, 1805.
5. 'Calorimetric Measurements on Cellular Systems: Recommendations for Measurements and Presentation of Results (Provisional)', *Pure Appl. Chem.* **1982**, 54, 671.
6. 'Manual of Symbols and Terminology for Physicochemical Quantities and Units. Appendix I. Definition of Activities and Related Quantities', *Pure Appl. Chem.* **1979**, 51, 37.
7. 'Manual of Symbols and Terminology for Physicochemical Quantities and Units. Appendix V. Symbolism and Terminology in Chemical Kinetics (Provisional)', *Pure Appl. Chem.* **1981**, 53, 753.
8. 'Manual of Symbols and Terminology for Physicochemical Quantities and Units. Appendix II. Definitions, Terminology, and Symbols in Colloid and Surface Chemistry, Part I', *Pure Appl. Chem.* **1972**, 31, 577; Part II. Heterogeneous Catalysis (Rules Approved 1975)', *Pure Appl. Chem.* **1976**, 46, 71.
9. 'Definitions, Terminology, and Symbols in Colloid and Surface Chemistry. Part 1.14: Light Scattering (Provisional)', *Pure Appl. Chem.* **1983**, 55, 931.
10. 'Reporting Experimental Pressure-Area Data with Film Balances (Recommendations 1984)', *Pure Appl. Chem.* **1985**, 57, 621.
11. 'Reporting Physisorption Data for Gas/Solid Systems with Special Reference to the Determination of Surface Area and Porosity (Provisional)', *Pure Appl. Chem.* **1982**, 54, 2201.
12. 'Reporting Experimental Data Dealing with Critical Micellization Concentrations (c.m.c.'s) of Aqueous Surfactant Systems', *Pure Appl. Chem.* **1979**, 51, 1083.
13. 'Chemical Nomenclature and Formulation of Compositions and Synthetic and Natural Zeolites', *Pure Appl. Chem.* **1979**, 51, 1091.
14. 'Manual of Symbols and Terminology Physicochemical Quantities and Units. Appendix II. Definitions, Terminology, and Symbols in Colloid and Surface Chemistry. Part 1.13. Selected Definitions, Terminology, and Symbols for Rheological Properties', *Pure Appl. Chem.* **1979**, 51, 1213.
15. 'Expression of Results in Quantum Chemistry', *Pure Appl. Chem.* **1978**, 50, 77.
16. 'Recommended Standards for Reporting Photochemical Data (Recommendations 1983)', *Pure Appl. Chem.* **1984**, 56, 939.
17. 'Test Data for Normal Coordinate Calculations', *Pure Appl. Chem.* **1985**, 57, 121.
18. 'Reporting Physisorption Data for Gas/Solid Systems with Special Reference to the Determination of Surface Area and Porosity (Recommendations 1984)', *Pure Appl. Chem.* **1985**, 57, 603.
19. 'Presentation of Molecular Parameter Values for Infrared and Raman Spectroscopy (Recommendations 1988)', *Pure Appl. Chem.* **1988**, 60, 1385.
20. 'Polarographic Half-Wave Potentials of Cations Nonaqueous Solvents', *Pure Appl. Chem.* **1990**, 62, 1839.
21. 'A Glossary of Terms Used in Chemical Kinetics, Including Reactions Dynamics (Recommendations 1996)', *Pure Appl. Chem.* **1996**, 82, 149.
22. 'Acronyms Used in Theoretical Chemistry', *Pure Appl. Chem.* **1996**, 82, 387.
23. 'Nomenclature of Structural and Compositional Characteristics of Ordered Microporous and Mesoporous Materials with Inorganic Hosts (Recommendations 2001)', *Pure Appl. Chem.* **2001**, 73, 381.

**V. Spectroscopy**

1. 'Recommendations for the Presentation of NMR Data for Publication in Chemical Journals', *Pure Appl. Chem.* **1972**, 29, 625.
2. 'Presentation of NMR Data for Publication in Chemical Journals. B. Conventions Relating to Spectra from Nuclei Other than Protons', *Pure Appl. Chem.* **1967**, 45, 217.
3. 'Recommendations for Publication of Papers on Methods of Molecular Absorption Spectrophotometry in Solution in between 200 and 800 nm', *Pure Appl. Chem.* **1978**, 50, 237.
4. 'Recommendations for Nomenclature and Symbolism for Mass Spectroscopy (Recommendations 1991)', *Pure Appl. Chem.* **1991**, 63, 1541.
5. 'Nomenclature and Conventions for Reporting Mössbauer Spectroscopy Data', *Pure Appl. Chem.* **1976**, 45, 221.
6. 'Nomenclature and Spectral Presentation in Electron Spectroscopy Resulting by Excitation by Photons', *Pure Appl. Chem.* **1976**, 45, 221.
7. 'Definitions and Symbolism of Molecular Constants', *Pure Appl. Chem.* **1978**, 50, 1707.
8. 'Nomenclature, Symbols, Units, and their Usage in Spectrochemical Analysis. Part I: General Atomic Emission Spectroscopy', *Pure Appl. Chem.* **1972**, 30, 651.
9. 'Nomenclature, Symbols, Units, and their Usage in Spectrochemical Analysis. Part II: Data Interpretation', *Pure Appl. Chem.* **1976**, 45, 99.
10. 'Nomenclature, Symbols, Units, and their Usage in Spectrochemical Analysis. Part III: Analytical Flame Spectroscopy and Associated Non-Flame Procedures', *Pure Appl. Chem.* **1976**, 45, 105.
11. 'Nomenclature, Symbols, Units, and their Usage in Spectrochemical Analysis. Part IV: Radiation Sources (Provisional)', *Pure Appl. Chem.* **1981**, 53, 1913.
12. 'Nomenclature, Symbols, Units, and their Usage in Spectrochemical Analysis. Part V: Radiation Sources (Provisional)', *Pure Appl. Chem.* **1981**, 53, 1913.
13. 'Nomenclature, Symbols, Units, and their Usage in Spectrochemical Analysis. Part VI: Molecular Luminescence Spectroscopy', *Pure Appl. Chem.* **1984**, 56, 231.
14. 'Names, Symbols, Definitions and Units of Quantities in Optical Spectroscopy (Recommendations 1984)', *Pure Appl. Chem.* **1985**, 57, 105.
15. 'Nomenclature, Symbols, Units, and their Usage in Spectrochemical Analysis – V. Radiation Sources (Recommendations 1985)', *Pure Appl. Chem.* **1985**, 57, 1453.
16. 'Quantitative Characterization of Procedures Using Ultraviolet and Visible Molecular Absorption Spectrophotometry', *Pure Appl. Chem.* **1986**, 58, 1015.
17. 'Nomenclature System for X-Ray Spectroscopy (Recommendations 1991)', *Pure Appl. Chem.* **1991**, 63, 735.
18. 'English-Derived Abbreviations for Experimental Techniques in Surface Science and Chemical Spectroscopy (Recommendations 1991)', *Pure Appl. Chem.* **1991**, 63, 887.
19. 'Guidelines on Nuclear Magnetic Computerized Databases (Recommendations 1995)', *Pure Appl. Chem.* **1995**, 67, 593.
20. 'Instrumentation for the Spectral Dispersion and Isolation of Optical Radiations (Recommendations 1995)', *Pure Appl. Chem.* **1995**, 67, 1725.
21. 'Detection of Radiation (Recommendations 1995)', *Pure Appl. Chem.* **1995**, 67, 1745.
22. 'Laser-Based Molecular Spectroscopy for Chemical Analysis: Laser Fundamentals (Recommendations 1995)', *Pure Appl. Chem.* **1995**, 67, 1913.
23. 'Symmetry, Selection Rules and Nomenclature Surface Spectroscopy (Recommendations 1996)', *Pure Appl. Chem.* **1996**, 82, 457.
24. 'Nomenclature, Symbols, Units, and their Usage in Spectrochemical Analysis – XVI. Laser-Based Molecular Spectroscopy for Chemical Analysis – Luminescence (Recommendations 1997)', *Pure Appl. Chem.* **1997**, 69, 1435.
25. 'Nomenclature, Symbols, Units, and their Usage in Spectrochemical Analysis – XVII. Laser-Based Molecular Spectroscopy for Chemical Analysis – Raman Scattering Processes (Recommendations 1997)', *Pure Appl. Chem.* **1997**, 69, 1451.
26. 'Recommendations for the Presentation of NMR Structures of Proteins and Nucleic Acids (Recommendations 1998)', *Pure Appl. Chem.* **1998**, 70, 117.
27. 'Nomenclature, Symbols, Units, and their Usage in Spectrochemical Analysis – XVI. Laser-Based Atomic Spectroscopy: A New Notation for Spectrochemical Processes (Recommendations 1997)', *Pure Appl. Chem.* **1998**, 70, 517.



28. 'NMR Nomenclature. Nuclear Spin Properties and Conventions for Chemical Shifts (Recommendations 2001)', *Pure Appl. Chem.* **2001**, 73, 1795.

#### VI. Macromolecular Chemistry

1. 'Stereochemical Definitions and Notations Relating to Polymers (Recommendations 1980)', *Pure Appl. Chem.* **1981**, 53, 733.
2. 'Nomenclature of Regular Single-Strand Organic Polymers (Rules Approved 1975)', *Pure Appl. Chem.* **1974**, 48, 373.
3. 'List of Standard Abbreviations (Symbols) for Synthetic Polymers and Polymer Materials (1974)', *Pure Appl. Chem.* **1974**, 40, 473.
4. 'Basic Definitions of Terms Relating Polymers (1974)', *Pure Appl. Chem.* **1974**, 40, 477.
5. 'Recommendations for Abbreviations of Terms Relating to Plastics and Elastomers', *Pure Appl. Chem.* **1968**, 18, 583.
6. 'Nomenclature for Regular Single-Strand and Quasi Single-Strand Inorganic and Coordination Polymers (Recommendations 1984)', *Pure Appl. Chem.* **1985**, 57, 149.
7. 'Source-Base Nomenclature for Copolymers (Recommendations 1985)', *Pure Appl. Chem.* **1985**, 57, 1427.
8. 'Use of Abbreviations for Names of Polymeric Substances (Recommendations 1986)', *Pure Appl. Chem.* **1987**, 59, 691.
9. 'A Classification of Linear Single-Strand Polymers (Recommendations 1988)', *Pure Appl. Chem.* **1989**, 61, 243.
10. 'Definitions of Terms Relating Individual Macromolecules, their Assemblies, and Dilute Polymer Solutions (Recommendations 1988)', *Pure Appl. Chem.* **1989**, 61, 211.
11. 'Definitions of Terms Relating to Crystalline Polymers (Recommendations 1988)', *Pure Appl. Chem.* **1989**, 61, 769.
12. 'The Study of Microstructures Poly(vinyl alcohol) by NMR', *Pure Appl. Chem.* **1990**, 62, 2139.
13. 'Nomenclature of Regular Double-Strand (Ladder or Spiro) Organic Polymers (Recommendations 1993)', *Pure Appl. Chem.* **1993**, 65, 1561.
14. 'Structure-Based Nomenclature for Irregular Single-Strand Organic Polymers (Recommendations 1994)', *Pure Appl. Chem.* **1994**, 66, 873.
15. 'Graphic Representations (Chemical Formulae) of Macromolecules (Recommendations 1994)', *Pure Appl. Chem.* **1994**, 66, 2469.
16. 'Basic Classification and Definitions of Polymerization Reactions (Recommendations 1994)', *Pure Appl. Chem.* **1994**, 66, 2469.
17. 'Terminology for Membranes and Membrane Processes (Recommendations 1996)', *Pure Appl. Chem.* **1996**, 82, 1479.
18. 'Definition of Terms Relating to the Non-ultimate Mechanical Properties of Polymers (Recommendations 1998)', *Pure Appl. Chem.* **1998**, 70, 701.
19. 'Definitions of Basic Terms Relating to Low-Molecular-Mass and Polymer Liquid Crystals (Recommendations 2001)', *Pure Appl. Chem.* **2001**, 73, 845.
20. 'Generic Source-Based Nomenclature for Polymers (Recommendations 2001)', *Pure Appl. Chem.* **2001**, 73, 1511.
21. 'Definitions of Basic Terms Relating to Polymer Liquid Crystals (Recommendations 2001)', *Pure Appl. Chem.* **2002**, 74, 493.
22. 'Definitions Relating to Stereochemically Asymmetric Polymerizations (Recommendations 2001)', *Pure Appl. Chem.* **2002**, 74, 915.
23. 'Nomenclature of Regular Single-Strand Organic Polymers (Recommendations 2002)', *Pure Appl. Chem.* **2002**, 74, 1921.
24. 'Errata to Generic Source-Based Nomenclature for Polymers (Recommendations 2001)', *Pure Appl. Chem.* **2002**, 74, 2019.

#### VII. Miscellaneous

1. 'Use of Abbreviations in the Chemical Literature (Recommendations 1979)', *Pure Appl. Chem.* **1980**, 52, 2229.
2. 'Glossary for Chemists of Terms Used in Biotechnology (Recommendations 1992)', *Pure Appl. Chem.* **1992**, 64, 143.
3. 'Units for Use in Atmospheric Chemistry (Recommendations 1995)', *Pure Appl. Chem.* **1995**, 67, 1377.
4. 'Compendium of Chemical Terminology (IUPAC Recommendations)', compiled by A. D. McNaught and A. Wilkinson, Blackwell Science, 1997.
5. 'Glossary of Terms Used in Medicinal Chemistry (Recommendations 1998)', *Pure Appl. Chem.* **1998**, 70, 1129.

**Appendix III. Some Symbols and Abbreviations Used by HCA**

Designation	Symbol	Remarks
Amount-of-substance concentration or 'molarity' <sup>a)</sup>	<i>M</i>	in mol/dm <sup>3</sup> , e.g. 1 <i>M</i> NaOH
Molality <sup>a)</sup>	<i>m</i>	in mol/kg; e.g. 1 <i>m</i> HCl
Normality <sup>a)</sup>	<i>N</i>	in equiv./dm <sup>3</sup> ; e.g. 1 <i>N</i> H <sub>2</sub> S
Percentage by mass	%	e.g. 15%
Percentage by volume	% (v/v)	e.g. 20% (v/v)
Melting point	m.p.	e.g. m.p. 157–158°
Boiling point	b.p.	e.g. b.p. 111–112°
Boiling point under a certain pressure	b.p./Torr	e.g. b.p. 65°/4 Torr
Freezing point	f.p.	e.g. f.p. 3°
Refractive index	<i>n</i>	e.g. <i>n</i> <sub>D</sub> <sup>20</sup> = 1.643
Relative density	<i>d</i>	e.g. <i>d</i> <sub>4</sub> <sup>20</sup> = 1.1811
Optical rotation <sup>b)</sup>	<i>α</i>	e.g. <i>α</i> = 0.73 ( <i>l</i> = 0.1, neat)
Specific optical rotation <sup>b)</sup>	[ <i>α</i> ]	e.g. [ <i>α</i> ] <sub>D</sub> <sup>25</sup> = 108 ( <i>c</i> = 3.42, CHCl <sub>3</sub> )
Molecular optical rotation <sup>b)</sup>	[ <i>M</i> ]	e.g. [ <i>M</i> ] <sub>588</sub> <sup>23</sup> = 380 ( <i>c</i> = 1.52, H <sub>2</sub> O)
Thin-layer chromatography	TLC	
Gas-liquid chromatography	GLC	
Liquid chromatography	LC	
Column chromatography	CC	
High-pressure (performance) liquid chromatography	HPLC	
Paper chromatography	PC	
Ultraviolet	UV	
Visible	VIS	
Circular dichroism	CD	
Optical rotatory dispersion	ORD	
Infrared (absorption)	IR	
Nuclear magnetic resonance of <sup>1</sup> H	<sup>1</sup> H-NMR	
Nuclear magnetic resonance of <sup>13</sup> C	<sup>13</sup> C-NMR	
Electron paramagnetic resonance	EPR	
Electron spin resonance	ESR	
Mass spectrum	MS	
Photoelectron spectroscopy	PES	
X-Ray photoelectron spectroscopy	XPES, ESCA	
Shoulder	sh	
Broad	br.	
Strong IR absorption	<i>s</i>	
Medium IR absorption	<i>m</i>	
Weak IR absorption	<i>w</i>	
Singlet	<i>s</i>	
Doublet	<i>d</i>	
Triplet	<i>t</i>	
Quadruplet	<i>q</i>	
Quintuplet	<i>quint.</i>	
Sextuplet	<i>sext.</i>	
Septuplet	<i>sept.</i>	
Multiplet	<i>m</i>	

<sup>a)</sup> For a comprehensive discussion on the usage of the terms 'equivalent' and 'normal', see *Pure Appl. Chem.* **1978**, *50*, 325.

<sup>b)</sup> The symbol *c* is used in connection with the specific optical rotation [*α*]; it is defined as mass of substance (in g) in 100 ml of solution. The quantities *l* and *d* in [*α*] = 100 · *α*/*l* · *c* or [*α*] = *α*/*l* · *d* are given in dm and g/ml (kg/m<sup>3</sup>), respectively.

**Appendix IV. Some Acceptable Non-SI Units**

Physical quantity	Name of unit	Symbol of unit
Length	Ångström	Å
	Bohr radius	$a_0$
Volume	Liter	l
	Milliliter	ml
	Microliter	$\mu\text{l}$
Time	Minute	min
	Hour	h
	Day	d
	Hertz	Hz
Frequency	Megahertz	MHz
	Gram	g
Mass	Milligram	mg
	Microgram	$\mu\text{g}$
	Bar	bar
Pressure	Millibar	mbar
	Torr	Torr
	Electronvolt	eV
Energy	Hartree	$H_a$ or $E_a$
	Degree Celsius	$^{\circ}\text{C}$
Temperature		
Dipole moment	Debye	D