

# THINGS IN CHEMISTRY AND PHYSICS NOT NAMED AFTER PEOPLE

© Dr. John Andraos, 2000 - 2007

Department of Chemistry, York University  
4700 Keele Street, Toronto, ONTARIO M3J 1P3, CANADA

For suggestions, corrections, additional information, and comments please send e-mails to [jandraos@yorku.ca](mailto:jandraos@yorku.ca)

<http://www.chem.yorku.ca/NAMED/>

## 3D QSAR (3-Dimensional quantitative structure-activity relationship) analysis

Marshall, G.R.; Barry, C.D.; Bosshard, H.E.; Dammkoehler, R.A.; Dunn, D.A. *ACS Symposium* **1979**, 112 (Computer Assisted Drug Design), 205

## A1 and A2 mechanisms

Day, J.N.E.; Ingold, C.K. *Trans. Faraday Soc.* **1941**, 37, 686

## Absolute zero measurements

Onnes, H.K.; Crommelin, C.A. *Communic. Phys. Lab. Leiden* **1906**, 95a, 1

Onnes, H.K.; Braak, C.; Clay, J. *Proc. Acad. Amsterdam* **1909**, 10, 422; 429

Onnes, H.K.; Braak, C. *K. Acad. Wetenschappen Amsterdam* **1910**, 11, 333; 344

Onnes, H.K.; Holst, G. *Verslag. Akad. Wetenschappen* **1914**, 23, 175

Gibson, G.E.; Giaque, W.F. *J. Am. Chem. Soc.* **1923**, 45, 93

Giaque, W.F. *J. Am. Chem. Soc.* **1927**, 49, 1864

Giaque, W.F.; Clark, C.W. *J. Am. Chem. Soc.* **1932**, 54, 3135

Giaque, W.F.; MacDougall, D.P. *Phys. Rev.* **1933**, 43, 768

Giaque, W.F.; MacDougall, D.P. *Phys. Rev.* **1933**, 44, 235

Giaque, W.F.; MacDougall, D.P. *Phys. Rev.* **1935**, 47, 885

Giaque, W.F.; MacDougall, D.P. *J. Am. Chem. Soc.* **1935**, 57, 1175

Giaque, W.F. *Ind. Eng. Chem.* **1936**, 28, 743

## Acidity function

Treffers, H.P.; Hammett, L.P. *J. Am. Chem. Soc.* **1937**, 59, 1708

## Actinometry

Bunsen, R.; Roscoe, H. *Phil. Trans.* **1857**, 147, 355; 381; 601

Bunsen, R.; Roscoe, H. *Phil. Trans.* **1859**, 149, 879

Bunsen, R.; Roscoe, H. *Phil. Trans.* **1864**, 153, 139

Bunsen, R.; Roscoe, H. *Ann. Physik* **1855**, 96, 373  
Bunsen, R.; Roscoe, H. *Ann. Physik* **1857**, 101, 235  
Bunsen, R.; Roscoe, H. *Ann. Physik* **1859**, 108, 193  
Roscoe, H. *Roy. Inst. Gr. Brit. Proc.* **1854 - 1858**, 2, 223  
Roscoe, H. *Roy. Inst. Gr. Brit. Proc.* **1858 - 1862**, 3, 210; 323  
Roscoe, H. *Roy. Inst. Gr. Brit. Proc.* **1862 - 1866**, 4, 128

### Alpha effect nucleophiles

Edwards, J.O.; Pearson, R.G. *J. Am. Chem. Soc.* **1962**, 84, 61  
Fina, N.J.; Edwards, J.O. *Int. J. Chem. Kinetics* **1973**, 5, 1

### Alpha particles

Rutherford, E. *Phil. Mag.* **1903**, 5, 177  
Rutherford, E.; Royds, T. *Phil. Mag.* **1909**, 17, 281  
Bragg, W.H. *Phil. Mag.* **1904**, 8, 719  
Ramsay, W.; Soddy, F. *Proc. Roy. Soc. London* **1905**, 72, 204  
Geiger, H.; Nuttall, J.M. *Phil. Mag.* **1911**, 22, 613

### Anchimeric assistance (neighbouring group participation)

Winstein, S.; Lucas, H.J. *J. Am. Chem. Soc.* **1939**, 61, 1576  
Winstein, S.; Buckles, R.E. *J. Am. Chem. Soc.* **1942**, 64, 2780; 2787; 2796  
Winstein, S.; Grunwald, E.; Buckels, R.E.; Hanson, C. *J. Am. Chem. Soc.* **1948**, 70, 816  
Winstein, S.; Grunwald, E.; Ingraham, L.L. *J. Am. Chem. Soc.* **1948**, 70, 821  
Winstein, S.; Lindegren, C.R.; Marshall, H.; Ingraham, L.L. *J. Am. Chem. Soc.* **1953**, 75, 147  
Baird, R.; Winstein, S. *J. Am. Chem. Soc.* **1957**, 79, 756; 4238

### Anomeric effect (Edward-Lemieux effect)

Lemieux, R.U. *Adv. Carbohydrate Chem.* **1954**, 9, 1  
Lemieux, R.U.; Chu, N.J. *Abstr. Papers ACS Meeting* **1958**, 133, 31N  
Edward, J.T. *ACS Symp. Ser.* **1993**, 539, 1  
Booth, H.; Lemieux, R.U. *Can. J. Chem.* **1971**, 49, 777  
Lemieux, R.U.; Koto, S. *Tetrahedron* **1974**, 30, 1933  
Lemieux, R.U.; Koto, S.; Voisin, D. *ACS Symp. Ser.* **1979**, 87, 17  
Lemieux, R.U.; Pavia, A.A.; Martin, J.C.; Watanabe, K.A. *Can. J. Chem.* **1969**, 47, 4427  
Thoegersen, H.; Lemieux, R.U.; Bock, K.; Meyer, B. *Can. J. Chem.* **1982**, 60, 44  
Lemieux, R.U.; Bock, K. *Arch. Biochem. Biophys.* **1983**, 221, 125  
Praly, J.P.; Lemieux, R.U. *Can. J. Chem.* **1987**, 65, 213

### Application of Marcus theory to proton transfer reactions

Koepl, G.W.; Kresge, A.J. *Chem. Commun.* **1973**, 371  
Kresge, A.J. *Chem. Soc. Rev.* **1974**, 2, 475

Kresge, A.J.; Sagatys, D.S.; Chen, H.L. *J. Am. Chem. Soc.* **1977**, 99, 7228

Kresge, A.J. *J. Am. Chem. Soc.* **1980**, 102, 7797

Lin, A.C.; Chiang, Y.; Dahlberg, D.B.; Kresge, A.J. *J. Am. Chem. Soc.* **1983**, 105, 5380

Pruszynski, P.; Chiang, Y.; Kresge, A.J.; Schepp, N.P.; Walsh, P.A. *J. Phys. Chem.* **1986**, 90, 3760

Albery, W.J.; Bernasconi, C.F.; Kresge, A.J. *J. Phys. Org. Chem.* **1988**, 1, 29

### **Aromatic substitution**

Koerner, W. *Gazz. Chim. Ital.* **1874**, 4, 305

### **Aromaticity**

Hückel, E., *Z. Physik* **1931**, 70, 204

Hückel, E., *Z. Physik* **1932**, 76, 628

Hückel, E., *Z. Elektrochem.* **1937**, 43, 752

### **Asymmetric induction**

Cram, D.J.; Abd Elhafez, F.A. *J. Am. Chem. Soc.* **1952**, 74, 5828

Cram, D.J.; Knight, J.D. *J. Am. Chem. Soc.* **1952**, 74, 5835

Cram, D.J.; Greene, F.D. *J. Am. Chem. Soc.* **1953**, 75, 6005

Cram, D.J.; Kopecky, K.R. *J. Am. Chem. Soc.* **1959**, 81, 2748

### **Asymmetric molecule with no asymmetric carbon atoms**

Christie, G.H.; Kenner, J. *J. Chem. Soc.* **1922**, 121, 614

### **Atom economy as reaction metric**

Trost, B.M. *Science* **1991**, 254, 1471

Trost, B.M. *Acc. Chem. Res.* **2002**, 35, 695

### **Atomic force microscopy**

Binnig, G.; Quate, C.F.; Gerber, C. *Phys. Rev. Lett.* **1986**, 56, 930

Binnig, G.; Gerber, C.; Stoll, E.; Albrecht, T.R.; Quate, C.F. *Europhys. Lett.* **1987**, 3, 1281

Rugar, D.; Hansma, P. *Physics Today* **1990**, 43(10), 23

### **Atomic nucleus**

Rutherford, E. *Phil. Mag.* **1911**, 21, 669

### **Atomic spectroscopy**

Alter, D. *Am. J. Sci. Arts* **1854**, 18, 55

Alter, D. *Am. J. Sci. Arts* **1855**, 19, 213

Kirchhoff, G. *Pogg. Ann.* **1860**, 109, 275

Kirchhoff, G.; Bunsen, R. *Pogg. Ann.* **1860**, 110, 160

Hartley, W.N. *J. Chem. Soc.* **1883**, 43, 390

### Atomic weight determinations of the elements

Richards, T.W. *J. Chim. Physique Phys. Chim. Biol.* **1908**, 6, 92

Richards, T.W. *J. Am. Chem. Soc.* **1912**, 34, 959

Richards, T.W. *J. Franklin Inst.* **1916**, 182, 78

Richards, T.W. *Bull. Soc. Chim. Fr.* **1922**, 31, 929

Richards, T.W. *Chem. Rev.* **1924**, 1, 1

### Atoms in Molecules (AIM)

Biegler-Koenig, F.W.; Nguyen-Dang, T.T.; Tal, Y.; Bader, R.F.W.; Duke, A.J. *J. Phys. B* **1981**, 14, 2739

Bader, R.F.W.; Nguyen-Dang, T.T. *Adv. Quantum Chem.* **1981**, 14, 63

Biegler-Koenig, F.W.; Bader, R.F.W.; Tang, T.H. *J. Comput. Chem.* **1982**, 3, 317

Bader, R.F.W. *Acc. Chem. Res.* **1985**, 18, 9

Bader, R.F.W.; Larouche, A.; Gatti, C.; Carroll, M.T.; MacDougall, P.J.; Wiberg, K.B. *J. Chem. Phys.* **1987**, 87, 1142

Bader, R.F.W.; Carroll, M.T.; Cheeseman, J.R.; Chang, C. *J. Am. Chem. Soc.* **1987**, 109, 7968

Bader, R.F.W. *Pure Appl. Chem.* **1988**, 60, 145

Bader, R.F.W.; Gillespie, R.J.; MacDougall, P.J. *J. Am. Chem. Soc.* **1988**, 110, 7329

Bader, R.F.W.; Laidig, K.E. *THEOCHEM* **1991**, 80, 75

Bader, R.F.W.; Popelier, P.L.A. *Int. J. Quantum Chem.* **1993**, 45, 189

Bader, R.F.W. *NATO ASC Ser., Ser. C* **1993**, 406, 313

Bader, R.F.W. *Int. J. Quantum Chem.* **1994**, 49, 299

Bader, R.F.W. *Atoms in Molecules: a quantum theory*, Oxford University Press: Oxford, 1994

Bader, R.F.W. *Can. J. Chem.* **1998**, 76, 973

Bader, R.F.W. *Can. J. Chem.* **1999**, 77, 86

Hernandez-Trujillo, J.; Bader, R.F.W. *J. Phys. Chem. A* **2000**, 104, 1779

### B1 and B2 mechanisms

Day, J.N.E.; Ingold, C.K. *Trans. Faraday Soc.* **1941**, 37, 686

### Blackbody radiation

Planck, M. *Ann. Physik* **1901**, 4, 553

### Catalysis

Ostwald, W. *J. Prakt. Chem.* **1883**, 27, 1

Berzelius, J.J. *Jahresberichte* **1835**, 15, 237

### Cell-free fermentation

Buchner, E.; Rapp, R. *Ber.* **1897**, 30, 117

## Chain mechanism (concept of chain transfer and vinyl polymerization kinetics)

Taylor, H.S.; Vernon, A.A. *J. Am. Chem. Soc.* **1931**, 53, 2527

Rice, O.K.; Sickman, D.V. *J. Am. Chem. Soc.* **1935**, 57, 1384

Flory, P.J. *J. Am. Chem. Soc.* **1937**, 59, 241

Starkweather, H.W.; Taylor, G.B. *J. Am. Chem. Soc.* **1930**, 52, 4708

## Chain reacting atomic pile

Fermi, E.; Segre, E. *Phys. Rev.* **1941**, 59, 680

Fermi, E. *Proc. Am. Phil. Soc.* **1946**, 90, 20

## Chair and boat ring conformations

Sachse, H. *Chem. Ber.* **1890**, 23, 1363

Mohr, E. *J. Prakt. Chem.* **1918**, 98, 315

Mohr, E. *J. Prakt. Chem.* **1922**, 103, 316

Derx, H.G. *Rec. Trav. Chim.* **1922**, 41, 312

Dickinson, R.G.; Billicke, C.J. *Am. Chem. Soc.* **1928**, 50, 764

## Chemical high pressure methods

Bergius, F. *Oesterr. Chem. Ztg.* **1912**, 15, 161

Bergius, F. *Z. Elektrochem.* **1912**, 18, 660

Bosch, C.; Lappe, F., U.S. Pat. 1,075,085 October 7, 1913

Bergius, F. *Z. Komp. Flüss. Gase* **1915**, 17, 33

Bosch, C., U.S. Pat. 1,188,530 June 27, 1916

## Chemiosmotic theory

Mitchell, P., *Nature* **1961**, 191, 144

Mitchell, P., *Eur. J. Biochem.* **1979**, 95, 1

Mitchell, P., *Science* **1979**, 206, 1148

Mitchell, P., in *Oxygen, Fuels, and Living Matter*, Semenza, G., Ed.; Wiley: New York, 1981; Part 1, pp 1 – 160

## Chevron plot

Chan, H.S.; Dill, K.A. *Proteins: Structure, Function, and Genetics* **1998**, 30, 2

## Chromatography

Twsett, M. *Ber. Deut. Bot. Ges.* **1906**, 24, 235

Strain, H.H.; Sherma, J. *J. Chem. Educ.* **1967**, 44, 238

Kuhn, R.; Lederer, E. *Chem. Ber.* **1931**, 64, 1349

## Co-ordination numbers in inorganic compounds

- Werner, A., *Chem. Ber.* **1907**, 40, 1433  
Werner, A., *Z. Physik. Chem.* **1901**, 38, 331  
Werner, A., *Z. Anorg. Chem.* **1893**, 3, 267  
Werner, A., *Z. Physik. Chem.* **1894**, 14, 506

## Coalescence phenomena and lineshape analysis

- Gutowsky, H.S.; Saika, A. *J. Chem. Phys.* **1953**, 21, 1688  
Gutowsky, H.S.; McCall, D.W.; Slichter, C.P. *J. Chem. Phys.* **1953**, 21, 279  
Gutowsky, H.S.; Meyer, L.H.; McClure, R.E. *Rev. Sci. Instrum.* **1953**, 24, 644  
Gutowsky, H.S. *Disc. Faraday Soc.* **1955**, 19, 187  
Phillips, W.D. *J. Chem. Phys.* **1955**, 23, 1363  
Gutowsky, H.S.; Holm, C.H. *J. Chem. Phys.* **1956**, 25, 1228  
Kaplan, J.I. *J. Chem. Phys.* **1958**, 28, 278  
McConnell, H.M. *J. Chem. Phys.* **1958**, 28, 430  
Alexander, S. *J. Chem. Phys.* **1962**, 37, 967; 974  
Kurland, R.J.; Rubin, M.B.; Wise, W.B. *J. Chem. Phys.* **1964**, 40, 2426  
Allerhand, A.; Gutowsky, H.S.; Jonas, J.; Meinzer, R.A. *J. Am. Chem. Soc.* **1966**, 88, 3185  
Whitesides, G.M.; Fleming, J.M. *J. Am. Chem. Soc.* **1967**, 89, 2855  
Saunders, M.; Hagen, E.L. *J. Am. Chem. Soc.* **1968**, 90, 2436  
Binsch, G. *J. Am. Chem. Soc.* **1969**, 91, 1304  
Kleier, D.A.; Binsch, G. *J. Magn. Reson.* **1970**, 3, 146  
Maher, J.P.; Yandle, K. *J. Chem. Soc. A* **1970**, 1339  
Spaargaren, K.; Korver, P.K.; van der Haak, P.J.; de Boer, T.J. *Org. Magn. Reson.* **1971**, 3, 605

## Colloids

- Zsigmondy, R. *Ann. Chem.* **1898**, 301, 29  
Zsigmondy, R. *Ann. Chem.* **1898**, 301, 361  
Zsigmondy, R.; Siedentopf, H.F.W. *Ann. Physik* **1904**, 10[4], 1  
Zsigmondy, R., *Colloids and the Ultramicroscope: A Manual of Colloid Chemistry and Ultramicroscopy*; Alexander, J., Trans.; Wiley: New York, 1909  
Zsigmondy, R.; Thiessen, P.A. *Das kolloide Gold*, Akademische Verlagsgesellschaft: Leipzig, 1925  
Svedberg, T., *Colloid Chemistry*, 2<sup>nd</sup> ed.; Chemical Catalog Co.: New York, 1928  
Svedberg, T., et al. *The Ultracentrifuge*, Clarendon Press: Oxford, 1940  
Svedberg, T.; Fahraeus, R. *J. Am. Chem. Soc.* **1926**, 48, 430  
Svedberg, T.; Nichols, J.B. *J. Am. Chem. Soc.* **1923**, 45, 2910  
Svedberg, T.; Stein, D.S. *J. Am. Chem. Soc.* **1923**, 45, 2613

## Combustion and explosives

- Hinshelwood, C.N. *Proc. Roy. Soc.* **1927**, 114A, 84  
Hinshelwood, C.N. *Trans. Faraday Soc.* **1922**, 17, 598

Hinshelwood, C.N. *Proc. Roy. Soc.* **1926**, 113A, 230  
Hinshelwood, C.N.; Thompson, H.W. *Proc. Roy. Soc.* **1929**, 122A, 610  
Hinshelwood, C.N.; Moelwyn-Hughes, E.A. *Proc. Roy. Soc.* **1932**, 138A, 311  
Hinshelwood, C.N.; Thompson, H.W. *Proc. Roy. Soc.* **1928**, 118A, 170  
Gibson, C.H.; Hinshelwood, C.N. *Proc. Roy. Soc.* **1928**, 119A, 591  
Semenov, N.N. *Z. Physik. Chem.* **1927**, 46, 109  
Semenov, N.N. *Z. Physik. Chem.* **1928**, 48, 571  
Zel'dovich, Y.B.; Semenov, N.N. *J. Phys. Chem. USSR* **1940**, 10, 12  
Semenov, N.N. *Chemical Kinetics and Chain Reactions*, Clarendon Press: Oxford, 1935

### Common ion effect

Bateman, L.C.; Hughes, E.D.; Ingold, C.K. *J. Chem. Soc.* **1940**, 960  
Bateman, L.C.; Hughes, E.D.; Ingold, C.K. *J. Chem. Soc.* **1940**, 974  
Bateman, L.C.; Church, M.G.; Hughes, E.D.; Ingold, C.K.; Taher, N.A. *J. Chem. Soc.* **1940**, 979  
Bateman, L.C.; Hughes, E.D.; Ingold, C.K. *J. Chem. Soc.* **1940**, 1017  
Benfey, O.T.; Hughes, E.D.; Ingold, C.K. *J. Chem. Soc.* **1952**, 2488  
Hawdon, A.R.; Hughes, E.D.; Ingold, C.K. *J. Chem. Soc.* **1952**, 2499  
Clarke, G.A.; Williams, T.R.; Taft, R.W. *J. Am. Chem. Soc.* **1962**, 84, 2292  
Clarke, G.A.; Taft, R.W. *J. Am. Chem. Soc.* **1962**, 84, 2295

### Comparative molecular field analysis (CoMFA)

Cramer, R.D. III; Patterson, D.E.; Bunce, J.D. *J. Am. Chem. Soc.* **1988**, 110, 5959  
Clark, M.; Cramer, R.D. III; Jones, D.M.; Patterson, D.E.; Simeroth, P.E. *Tetrahedron Computer Methodology*, **1990**, 3, 47  
Cramer, R.D. III; Wold, S.B. US Pat 5,025,388 (1991-06-18)  
Cramer, R.D. III; Clark, M.; Simeroth, P.E.; Patterson, D.E. *Pharmacochemistry Library*, **1991**, 16(QSAR), 239  
Cramer, R.D. III; DePriest, S.A.; Patterson, D.E.; Hecht, P. in *3D QSAR Drug. Des.* (Hugo Kubinyi, ed.), ESCOM: Leiden, 1993, p. 443

### Concept of atropisomerism

Kuhn, R. *Molekulare Asymmetrie in Stereochemie*, (H. Freuberg, ed.) Franz, Deutike: Leipzig-Wien, 1933, p. 803

### Concept of combinatorial chemistry

#### Solid-phasesynthesis

Merrifield, R.B. *J. Am. Chem. Soc.* **1963**, 85, 2149  
Patchornik, A.; Kraus, M.A. *J. Am. Chem. Soc.* **1970**, 92, 7587  
Crowley, J.I.; Rapoport, H. *J. Am. Chem. Soc.* **1970**, 92, 6363

Camps, F.; Castells, J.; Ferrando, M.J.; Font, J. *Tetrahedron Lett.* **1971**, 20, 1713

Leznoff, C.C.; Wong, J.Y. *Can. J. Chem.* **1972**, 50, 2892

Leznoff, C.C. *Chem. Soc. Rev.* **1974**, 3, 65

Crowley, J.I.; Rapoport, H. *Acc. Chem. Res.* **1976**, 9, 135

Leznoff, C.C. *Acc. Chem. Res.* **1978**, 11, 327

Frechet, J.M.J. *Tetrahedron* **1981**, 37, 663

#### Application to oligonucleotide synthesis

Frank, R.; Heikens, W.; Heisterberg-Montsis, G.; Blocker, H. *Nucl. Acids Res.* **1983**, 11, 4365

#### Application to peptide library

Geysen, H.M.; Meloen, R.H.; Barteling, S.J. *Proc. Natl. Acad. Sci. USA* **1984**, 81, 3998

#### "Tea bag" strategy

Houghten, R.A. *Proc. Natl. Acad. Sci. USA* **1985**, 82, 5131

#### "Multi-pin" technology

Geysen, H.M.; Meleon, R.H.; Barteling, S.J. *Proc. Natl. Acad. Sci. USA* **1984**, 81, 3998

Geysen, H.M.; Barteling, S.J.; Meleon, R.H. *Proc. Natl. Acad. Sci. USA* **1985**, 82, 178

Bunin, B.A.; Ellman, J.A. *J. Am. Chem. Soc.* **1992**, 114, 10997

#### "Split synthesis" or "split and pool" technique

Geysen, H.M.; Rodda, S.J.; Mason, T.J. *Mol. Immunol.* **1986**, 23, 709

Furka, A.; Sebestyen, F.; Asgedom, M.; Dibo, G. *Abstr. 14<sup>th</sup> Int. Congr. Biochem. Prague, Czechoslovakia*, **1988**, 13, 47

Furka, A.; Sebestyen, F.; Asgedom, M.; Dibo, G. *Abstr. 10<sup>th</sup> Int. Symp. Med. Chem., Budapest, Hungary*, **1988**, 288

Scott, J.K.; Smith, G.P. *Science* **1990**, 249, 404

Tjoeng, F.S.; Towery, D.S.; Bullock, J.W.; Whipple, D.E.; Fok, K.F.; Williams, M.H.; Zupec, M.E.; Adams, S.P. *Int. J. Pept. Protein Res.* **1990**, 35, 141

Cwirla, S.; Peters, E.A.; Barrett, R.W.; Dower, W.J. *Proc. Natl. Acad. Sci.* **1990**, 87, 6378

Devlin, J.J.; Panganiban, L.C.; Devlin, P.E. *Science* **1990**, 249, 404

Fodor, S.P.A.; Read, J.L.; Pirrung, M.C.; Stryer, L.; Lu, T.; Solas, D. *Science* **1991**, 251, 767

Furka, A.; Sebestyen, F.; Asgedom, M.; Dibo, G. *Int. J. Peptide Prot. Res.* **1991**, 37, 487

Lam, K.S.; Salmon, S.E.; Hersh, E.M.; Hruby, V.J.; Kazmierski, W.M.; Knapp, R.J. *Nature* **1991**, 354, 82

Houghten, R.A.; Pinilla, C.; Blondelle, S.E.; Appel, J.R.; Dooley, C.T.; Cuervo, J.H. *Nature* **1991**, 354, 84

Nicolaou, K.C.; Xiao, X.Y.; Parandoosh, Z.; Senyei, A.; Nova, M.P. *Angew. Chem. Int. Ed.* **1995**, 34, 2289

Furka, A. *Drug Development Res.* **1995**, 36, 1

Furka, A. *Chem. Intell.* **1999**, 5, 22

Furka, A. *Combin. Chem. High Throughput Screening* **2000**, 3, 197

Furka, A. *Drug Discovery Today* **2002**, 7, 1

#### "One bead method"

Lam, K.S.; Salmon, S.E.; Hersh, E.M.; Hruby, V.J.; Kazmierski, W.M.; Knapp, R.J. *Nature* **1991**, 354, 82

### **Concept of complementarity in association with biological macromolecules**

Pauling, L. *J. Am. Chem. Soc.* **1940**, 62, 2643

Pauling, L. *Ann. Rev. Biophys. Biophys. Chem.* **1986**, 15, 1

### **Concept of conformation**

Haworth, W.H. *The Constitution of the Sugars*, Edward Arnold & Co.: London, 1929, p. 90

### **Concept of DNA as substance of heredity**

Avery, O.T.; MacLeod, C.; McCarty, M. *J. Exp. Med.* **1944**, 79, 137

### **Concept of DNA base complementarity**

Chargaff, E. *Experientia* **1950**, 6, 201

### **Concept of energy production from ATP via enzyme catalysis**

Engelhardt, V.A.; Lyubimova, M.N. *Nature* **1939**, 144, 668

### **Concept of energy-rich pyrophosphate bonds**

Meyerhof, O.; Lohmann, K. *Naturwissenschaften* **1931**, 19, 575

Meyerhof, O.; Lohmann, K. *Biochem. Z.* **1932**, 253, 431

Lipmann, F. *Adv. Enzymology* **1941**, 1, 99

### **Concept of isobestic point**

Thiel, A.; Dassler, A.; Wulfken, F. *Fortschritte Chem. Physik Physik. Chem.* **1924**, 18, 3

Prideaux, E.B.R. *Chem. Ind.* **1926**, 4, 678; 697

### **Concept of laser**

Schawlow, A.R.; Townes, C.H. *Phys. Rev.* **1958**, 112, 1940

Solon, L.R.; Aronson, R.; Gould, G. *Science* **1961**, 134, 1506  
Rabinowitz, P.; Jacobs, S.; Gould, G. *Appl. Opt.* **1962**, 1, 513  
Jacobs, S.; Gould, G.; Rabinowitz, P. *Phys. Rev. Lett.* **1961**, 7, 415  
Gould, G. *Appl. Opt. Suppl.* **1965**, 2, 59  
Jarrett, S.M.; Nunez, J.; Gould, G. *Appl. Phys. Lett.* **1965**, 7, 294  
Piltch, M.; Gould, G. *Rev. Sci. Instrum.* **1966**, 37, 925  
Piltch, M.; Walter, W.T.; Solimene, N.; Gould, G.; Bennett, W.R. Jr. *Appl. Phys. Lett.* **1965**, 7, 309  
Jarrett, S.M.; Nunez, J.; Gould, G. *Appl. Phys. Lett.* **1966**, 8, 150  
Walter, W.T.; Solimene, N.; Piltch, M.; Gould, G. *IEEE J. Quant. Electronics* **1966**, 2, 474  
Gould, G. US Pat. 4,053,845 (1977/10/11) Optically pumped laser amplifiers

### **Concept of lock and key**

Fischer, E. *Chem. Ber.* **1894**, 27, 2985

### **Concept of osmosis ("endosmose") and diffusion ("exosmose")**

Dutrochet, R.H. *Ann. Chim. Phys.* **1827**, 35, 393  
Dutrochet, R.H. *Ann. Chim. Phys.* **1828**, 37, 191  
Dutrochet, R.H. *Ann. Chim. Phys.* **1832**, 49, 411  
Dutrochet, R.H. *Ann. Chim. Phys.* **1832**, 51, 159  
Dutrochet, R.H. *Ann. Chim. Phys.* **1835**, 60, 337

### **Concept of partial charges in chemical structures**

Ingold, C.K.; Ingold, E.H. *J. Chem. Soc.* **1926**, 1310

### **Concept of philicity of singlet carbenes**

Moss, R.A.; Mallon, C.B.; Ho, C.T. *J. Am. Chem. Soc.* **1977**, 99, 4105  
Moss, R.A. *Acc. Chem. Res.* **1980**, 13, 58  
Moss, R.A.; Shen, S.; Hadel, L.M.; Kmiecik-Lawrynowicz, G.; Wlostowska, J.; Krogh-Jespersen, K. *J. Am. Chem. Soc.* **1987**, 109, 4341

### **Concept of protein as infectious agent (prion)**

Griffith, J.S. *Nature* **1967**, 215, 1043

### **Concept of quasicrystals**

Shechtman, D.; Blech, I.; Gratias, D.; Cahn, J.W. *Phys. Rev. Lett.* **1984**, 53, 1951

### **Concept of receptor**

Ehrlich, P. *Studies on Immunity*, Wiley: New York, 1906

### **Concept of resonance hybrids**

Bury, C.R. *J. Am. Chem. Soc.* **1935**, 57, 2115

### **Concept of transport numbers for anions and cations**

Hittorf, W. *Ann. Pogg.* **1853**, 89, 177

Hittorf, W. *Ann. Pogg.* **1856**, 98, 1

Hittorf, W. *Ann. Pogg.* **1858**, 103, 1

Hittorf, W. *Ann. Pogg.* **1859**, 106, 337; 513

### **Concept of valence**

Frankland, E. *Phil. Trans. Roy. Soc.* **1852**, 142, 417

### **Concepts in condensed matter physics**

Landau, L.D. *Phys. Z. Sowjet.* **1937**, 11, 26; 129; 545

Landau, L.D.; Pomeranchuk, I. *Phys. Z. Sowjet.* **1936**, 10, 649

Landau, L.D. *J. Phys. USSR* **1941**, 5, 71

Landau, L.D. *J. Phys. USSR* **1946**, 11, 91

Landau, L.D. *J. Phys. USSR* **1943**, 7, 99

Landau, L.D. *J. Phys. USSR* **1944**, 8, 1

Landau, L.D.; Khalatnikov, I.M. *JETP* **1949**, 19, 637; 709

Landau, L.D.; Ginzburg, V.L. *JETP* **1950**, 20, 1064

Landau, L.D. *JETP* **1956**, 30, 1058

Landau, L.D. *JETP* **1957**, 32, 59

Landau, L.D. *JETP* **1958**, 35, 97

### **Concept that green parts of plants absorb carbon dioxide so that light energy is transformed into chemical energy**

Dutrochet, R.H. *Ann. Chim. Phys.* **1832**, 51, 159

Dutrochet, R.H. *Ann. Chim. Phys.* **1835**, 60, 337

### **Conformation in organic synthesis**

Hassel, O. *Tidsskr. Kjemi* **1943**, 5, 32

Bastiansen, O.; Hassel, O. *Nature* **1946**, 157, 765

Barton, D.H.R., *Experientia* **1950**, 6, 316

Barton, D.H.R. *J. Chem. Soc.* **1953**, 1027

Barton, D.H.R., *Top. Stereochem.* **1972**, 6, 1

Barton, D.H.R., *Chem. Ind.* **1956**, 1136

### **Connection between colour and degree of conjugation in chemical structure**

Graebe, C.; Liebermann, C. *Chem. Ber.* **1868**, 1, 106

Witt, O.N. *Chem. Ber.* **1876**, 9, 522

Witt, O.N. *J. Chem. Soc. Trans.* **1886**, 49, 391

Armstrong, H.E. *J. Chem. Soc. Proc.* **1888**, 4, 27

Armstrong, H.E. *J. Chem. Soc. Proc.* **1892**, 8, 101; 103; 189; 194

Armstrong, H.E. *J. Chem. Soc. Trans.* **1892**, 62, 789

Armstrong, H.E. *J. Chem. Soc. Proc.* **1893**, 9, 52; 55; 63; 206

Armstrong, H.E. *J. Chem. Soc. Proc.* **1896**, 12, 42

### **Connection between structure and function of proteins**

Sela, M.; White, F.H., Jr.; Anfinsen, C.B. *Science* **1957**, 125, 691

Haber, E.; Anfinsen, C.B. *J. Biol. Chem.* **1962**, 237, 1839

Anfinsen, C.B. *Science* **1973**, 181, 223

### **Connection between SN2 mechanism and Walden inversion rule**

Phillips, H. *J. Chem. Soc.* **1923**, 123, 44

Kenyon, J.; Phillips, H. *Trans. Faraday Soc.* **1930**, 26, 451

Phillips, H.; Kenyon, J. *J. Chem. Soc.* **1932**, 108; 1232

Phillips, H.; Kenyon, J. *J. Chem. Soc.* **1933**, 179

### **Covalent bonding**

Langmuir, I. *J. Am. Chem. Soc.* **1916**, 38, 2221

Langmuir, I. *J. Am. Chem. Soc.* **1919**, 41, 868; 1543

Langmuir, I. *J. Am. Chem. Soc.* **1920**, 42, 274

### **Crossover experiment**

Hurd, C.D.; Schmerling, L. *J. Am. Chem. Soc.* **1937**, 59, 107

### **Crystal lattice energy**

Mayer, J.E. *J. Chem. Phys.* **1933**, 1, 270; 327

Lennard-Jones, J.E.; Ingham, A.E. *Proc. Roy. Soc. A* **1925**, 107, 636

Mayer, J.E.; Levy, R.B. *J. Chem. Phys.* **1933**, 1, 647

### **Crystallization of enzymes**

Sumner, J.B. *J. Biol. Chem.* **1926**, 69, 435

Sumner, J.B.; Hand, D.B. *J. Biol. Chem.* **1927**, 76, 149

Sumner, J.B. *J. Chem. Educ.* **1937**, 14, 255

### **Curly arrow notation depicting electron flow in reaction mechanisms**

Kermack, W.O.; Robinson, R. *J. Chem. Soc.* **1922**, 121, 427

Robinson, R. *Two Lectures on an Outline of an Electrochemical (Electronic) Theory of the Course of Organic Reactions*, Institute of Chemistry of Gr. Britain & Ireland: London, 1932

### **Density functional theory**

Hohenberg, P.; Kohn, W. *Phys. Rev.* **1964**, 136, B864

Kohn, W.; Sham, L.J. *Phys. Rev.* **1965**, 140, A1133

Mermin, N.D. *Phys. Rev.* **1965**, 137A, 1441

Schlüter, M.; Sham, L.J. *Physics Today* **1982**, 35(2), 36

Becke, A.D., *Phys. Rev. A* **1988**, 38, 3098

Lee, C.; Yang, W.; Parr, R.G., *Phys. Rev. B* **1988**, 37, 785

### **Depletion of ozone in atmosphere**

Molina, M.J.; Rowland, F.S. *Nature* **1974**, 249, 810

### **Development of the cyclotron**

Lawrence, E.O.; Livingston, M.S. *Science* **1930**, 72, 376

Lawrence, E.O.; Livingston, M.S. *Phys. Rev.* **1931**, 38, 834

Lawrence, E.O.; Livingston, M.S. *Phys. Rev.* **1932**, 40, 19

Lawrence, E.O.; Livingston, M.S. *Phys. Rev.* **1934**, 45, 608

Lawrence, E.O.; Cooksey, D. *Phys. Rev.* **1936**, 50, 1131

Lawrence, E.O. *Prix Nobel* **1951**, 127

### **Diastereomer and enantiomer definition**

Meyer, V., Jacobson, P.H. *Lehrbuch der Organischen Chemie* (2<sup>nd</sup> ed.) Vol. 1, Pt. 1, Veit: Leipzig, 1907, p. 101, 113-4

### **Dipole moment measurements to elucidate stereochemistry**

Jensen, K.A. *Z. Anorg. Chem.* **1935**, 225, 97

Jensen, K.A. *Z. Anorg. Chem.* **1936**, 229, 225; 265; 282

Jensen, K.A. *Z. Anorg. Chem.* **1937**, 231, 365

Jensen, K.A. *Z. Anorg. Chem.* **1943**, 250, 268

Jensen, K.A. *Acta Chem. Scand.* **1949**, 3, 1446; 1447

### **Dipole moment vectorial analysis based on molecular geometry**

Thomson, J.J. *Phil. Mag.* **1923**, 46, 497

### **Directing groups in aromatic chemistry**

Holleman, Arnold F. *Die Direkte Einfuhrung von Substituenten in den Benzolkern*, Leipzig, 1910

Holleman, A.F. *Chem. Rev.* **1924**, 1, 137

### **Discovery of adenosine diphosphate (ADP)**

Lohmann, K. *Naturwissenschaften* **1934**, 22, 409

### **Discovery of adenosine triphosphate (ATP)**

Lohmann, K. *Naturwissenschaften* **1929**, 17, 624

### **Discovery of boranes**

**B2H6**

Stock, A.; Frederici, K. *Chem. Ber.* **1913**, 46, 1959

Stock, A. *Z. Elektrochem. Angew. Physik. Chem.* **1914**, 19, 779

Stock, A.; Frederici, K.; Priess, O. *Tech. Hochschule Breslau Ber.* **1914**, 46, 3353

**B4H10**

Stock, A.; Massenez, C. *Chem. Ber.* **1912**, 45, 3539

Stock, A.; Frederici, K. *Chem. Ber.* **1913**, 46, 1959

Stock, A.; Pohland, E. *Chem. Ber.* **1926**, 59B, 2223

**B5H9**

Stock, A.; Kurzen, F.; Laudenklos, H. *Z. Anorg. Allgem. Chem.* **1935**, 225, 243

Stock, A.; Laudenklos, H. *Z. Anorg. Allgem. Chem.* **1936**, 228, 178

**B5H11**

Stock, A.; Siecke, W. *Chem. Ber.* **1924**, 57B, 562

Stock, A.; Pohland, E. *Chem. Ber.* **1926**, 59B, 2210

**Discovery of borazine**

Stock, A.; Wierl, R. *Z. Anorg. Allgem. Chem.* **1931**, 203, 228

**Discovery of C<sub>60</sub> (buckminsterfullerene)**

Kroto, H.W.; Heath, J.R.; O'Brien, S.C.; Curl, R.F.; Smalley, R.E. *Nature* **1985**, 318(6042), 162

Heath, J.R.; O'Brien, S.C.; Zhang, Q.; Liu, Y.; Curl, R.F.; Tittel, F.K.; Smalley, R.E. *J. Am. Chem. Soc.* **1985**, 107, 7779

Zhang, Q.L.; O'Brien, S.C.; Heath, J.R.; Liu, Y.; Curl, R.F.; Kroto, H.W.; Smalley, R.E. *J. Phys. Chem.* **1986**, 90, 525

Kroto, H.W. *Nature* **1987**, 329(6139), 529

Kroto, H.W. *Science* **1988**, 242(4882), 1139

Curl, R.F.; Smalley, R.E. *Science* **1988**, 242(4881), 1017

Curl, R.F.; Smalley, R.E. *Sci. Am.* **1991**, 265(4), 54

Curl, R.F. *Phil. Trans. Roy. Soc. London A* **1993**, 343(1667), 19

Curl, R.F. *Rev. Mod. Phys.* **1997**, 69, 691

**Discovery of carbon-14**

Ruben, S.; Kamen, M.D. *Phys. Rev.* **1941**, 59, 349

Kamen, M.D. *Science* **1963**, 140, 584

Kamen, M.D. *Adv. Tracer Methodology* **1965**, 2, 1

Kamen, M.D. *J. Chem. Educ.* **1963**, 40, 234

**Discovery of cyclodextrins**

Villiers, A. *Compt. Rend.* **1891**, 112, 435; 536

Villiers, A. *Compt. Rend.* **1891**, 113, 144

Villiers, A. *Bull. Soc. Chim. Fr.* **1891**, 5[3], 468; 470

Schardinger, F. *Z. Untersuch. Nahr. Und Genussm.* **1903**, 6, 865

Schardinger, F. *Wien Klin. Wochenschr.* **1904**, 17, 207

Schardinger, F. *Zentr. Bakteriolog. Parasitenk. Abt. II* **1905**, 14, 772

#### Naming of $\alpha$ -, $\beta$ -, and $\gamma$ -cyclodextrins

Schardinger, F. *Zentralbl. Bakteriolog. Abt. II* **1911**, 29, 188

#### $\gamma$ -cyclodextrin

Freudenberg, K.; Cramer, F. *Z. Naturforsch.* **1948**, 3B, 464

#### Structural determination

Karrer, P.; Nageli, C. *Helv. Chim. Acta* **1921**, 4, 169

Miekeley, A. *Chem. Ber.* **1932**, 65, 69

Freudenberg, K.; Blomquist, G.; Ewald, L.; Soff, K. *Chem. Ber.* **1936**, 69, 1258

Freudenberg, K.; Rapp, W. *Chem. Ber.* **1936**, 69, 2041

Freudenberg, K.; Meyer-Delius, M. *Chem. Ber.* **1938**, 71, 1596

Freudenberg, K.; Boppel, H.; Meyer-Delius, M. *Naturwissen.* **1938**, 26, 123

#### Inclusion complexes

Freudenberg, K.; Cramer, F.; Plieninger, H. DE 895,769 (1953)

Cramer, F.; Hettler, H. *Naturwiss.* **1967**, 54, 625

#### Production from degradation of starch

French, D. *Adv. Carbohydrate Chem.* **1957**, 12, 189

#### Total synthesis

Takahashi, Y.; Ogawa, T. *Carbohydrate Res.* **1987**, 164, 277

### **Discovery of cytochromes**

Keilin, D. *Compt. Rend. Soc. Biol.* **1927**, 97(24) Appendix 39

Keilin, D. *Proc. Roy. Soc. London* **1930**, B106, 418

Hill, R.; Keilin, D. *Proc. Roy. Soc. London* **1931**, B109, 29

Dixon, M.; Hill, R.; Keilin, D. *Proc. Roy. Soc. London* **1931**, B109, 29

Keilin, D. *Ergebnisse Enzymforsch.* **1933**, 2, 239

Keilin, D. *Nature* **1934**, 133, 290

Keilin, D. *Bull. Soc. Chim. Biol.* **1936**, 18, 96

Green, D.E.; Keilin, D. *Ann. Rev. Biochem.* **1936**, 5, 1

Keilin, D.; Hartree, E.F. *Proc. Roy. Soc. London* **1938**, B125, 171

Keilin, D.; Hartree, E.F. *Nature* **1938**, 141, 870

Keilin, D.; Hartree, E.F. *Proc. Roy. Soc. London* **1939**, B127, 167

### **Discovery of dendrimers**

Tomalia, D.A.; Dewald, J.R. (Dow Chemical Co. USA) WO 8402705 (1984-07-19)

Tomalia, D.A.; Baker, H.; Dewald, J.; Hall, M.; Kallos, G.; Martin, S.; Roeck, J.; Ryder, J.; Smith, P. *Polymer J. (Tokyo)* **1985**, 17, 117

Tomalia, D.A.; Baker, H.; Dewald, J.; Hall, M.; Kallos, G.; Martin, S.; Roeck, J.; Ryder, J.; Smith, P. *Macromolecules* **1986**, 19, 2466

Tomalia, D.A.; Dewald, J.R. (Dow Chemical Co. USA) US 4587329 (1986-05-06)

Tomalia, D.A.; Hall, M.; Hedstrand, D.M. *J. Am. Chem. Soc.* **1987**, 109, 1601

Tomalia, D.A.; Berry, V.; Hall, M.; Hedstrand, D.M. *Macromolecules* **1987**, 20, 1164

Padias, A.B.; Hall, J.K. Jr.; Tomalia, D.A.; McConnell, J.R. *J. Org. Chem.* **1987**, 52, 5305

### Discovery of deuterium

Urey, H.C.; Brickwedde, F.G.; Murphy, G.M., *Phys. Rev.* **1932**, 39, 164; 864

Urey, H.C.; Brickwedde, F.G.; Murphy, G.M., *Phys. Rev.* **1932**, 40, 1

Urey, H.C.; Washburn, E.W., *Proc. Natl. Acad. Sci. U.S.A.* **1932**, 18, 496

### Discovery of electron

Thomson, J.J. *Phil. Mag.* **1897**, 44, 293

Wiechert, J.E. *Ann. Phys.* **1897**, 61, 544

### Discovery of gas hydrates

Davy, H. *Phil. Trans. Roy. Soc.* **1811**, 101, 155

Faraday, M. *Phil. Trans. Roy. Soc.* **1823**, 113, 160 (Cl<sub>2</sub> • 6H<sub>2</sub>O)

### Discovery of hydrated electron

Hart, E.J.; Boag, J.W. *J. Am. Chem. Soc.* **1962**, 84, 4090

### Discovery of inorganic phosphate in cells

Lohmann, K. *Biochem. Z.* **1928**, 202, 466

### Discovery of isomorphism and polymorphism

Mallard, F.E. *Annales des Mines* **1876**, 10[7], 60

Mallard, F.E. *Annales des Mines* **1881**, 19[7], 256

Mallard, F.E. *Bull. Soc. Fr. Mineralogie* **1880**, 3, 3

### Discovery of liquid crystals

Reinitzer, F. *Monatsh. Chem.* **1888**, 9, 421

Reinitzer, F. *Ann. Physik* **1908**, 27[4], 213

Lehmann, O. *Ann. Physik* **1908**, 25[4], 852

Reinitzer, F. *Liquid Crystals* **1989**, 5, 7 (translation of 1888 paper)

## Discovery of metal carbonyls

Mond, L.; Langer, C.; Quincke, F. *J. Chem. Soc.* **1890**, 57, 749

## Discovery of neutron

Chadwick, J. *Nature* **1932**, 129, 312

Chadwick, J. *Proc. Roy. Soc. London A* **1932**, 136, 692

Chadwick, J. *Z. Elektrochem.* **1932**, 38, 546

Chadwick, J. *Brit. J. Radiol.* **1933**, 6, 24

Chadwick, J. *Proc. Roy. Soc. London A* **1933**, 142, 1

## Discovery of nucleic acid bases

### Guanine

Kossel, A. *Z. Physiol. Chem.* **1883-4**, 8, 404

Kossel, A. *Chem. Ber.* **1883**, 17, 537

### Adenine and Thymine

Kossel, A. *Z. Physiol. Chem.* **1886**, 10, 248

Kossel, A. *Z. Physiol. Chem.* **1888**, 12, 241

Kossel, A. *Z. Physiol. Chem.* **1896**, 22, 188

Kossel, A. *Chem. Ber.* **1885**, 18, 79; 1928

Kossel, A. *Chem. Ber.* **1887**, 20, 3356

Kossel, A. *Chem. Ber.* **1888**, 21, 2164

Kossel, A.; Neumann, A. *Chem. Ber.* **1893**, 26, 2753

Kossel, A.; Neumann, A. *Chem. Ber.* **1894**, 27, 2215

### Cytosine

Kossel, A.; Steudel, H. *Z. Physiol. Chem.* **1903**, 38, 49

### Uracil

Kossel, A.; Steudel, H. *Z. Physiol. Chem.* **1902-1903**, 37, 245

## Discovery of metallocenes

Fischer, E.O.; Kreiter, C.G.; Muller, J.; Huttner, G.; Lorenz, H.

*Angew. Chem. Int. Ed. Engl.* **1973**, 12, 564

Fischer, E.O.; Maasbol, A. *Angew. Chem. Int. Ed. Engl.* **1964**, 3, 580

Fischer, E.O.; Pfab, W. *Z. Naturforsch.* **1952**, 76, 377

Fischer, E.O. *Adv. Organometallic Chem.* **1976**, 14, 1

Wilkinson, G.; Rosenblum, M.; Whiting, M.C.; Woodward, R.B.

*J. Am. Chem. Soc.* **1952**, 74, 2125

Osborn, J.A.; Jardine, F.H.; Young, J.F.; Wilkinson, G.J. *Chem. Soc. A* **1966**, 1711

Wilkinson, G. *Angew. Chem. Int. Ed. Engl.* **1974**, 86, 664

Wilkinson, G.J. *Organometallic Chem.* **1975**, 100, 273

Wilkinson, G.; Cotton, F.A. *Prog. Inorg. Chem.* **1959**, 1, 1

### **Discovery of noble gas compound (XePtF<sub>6</sub>)**

Bartlett, N. *Proc. Chem. Soc.* **1963**, 218

### **Discovery of optical activity in co-ordination compounds**

Werner, A. *Chem. Ber.* **1911**, 44, 1887 (experimental section written by Victor Louis King (14.3.1886-1958) b. Nashville, Tennessee, USA; PhD 1912 Zurich (A. Werner))

Werner, A.; Berl, E.; Zinggeler, E.; Jantsch, G. *Chem. Ber.* **1907**, 40, 2103

Werner, A. *Chem. Ber.* **1914**, 47, 3087

### **Discovery of organometallic complexes of dihydrogen**

Kubas, G.J.; Ryan, R.R.; Swanson, B.I.; Vergamini, P.J.; Wasserman, H.J.

*J. Am. Chem. Soc.* **1984**, 106, 451

### **Discovery of organometallic complexes of dinitrogen**

Allen, A.D.; Senoff, C.V. *Chem. Commun.* **1965**, 621

Bottomley, F.; Nyburg, S.C. *Chem. Commun.* **1966**, 897

Allen, A.D.; Bottomley, F.; Harris, R.O.; Reinsalu, V.P.; Senoff, C.V. *J. Am. Chem. Soc.* **1967**, 89, 5595

Senoff, C.V. *J. Chem. Educ.* **1990**, 67, 368

### **Discovery of parahydrogen**

Bonhoeffer, K.F.; Harteck, P. *Naturwiss.* **1929**, 17, 182

### **Discovery of RNA codons for protein synthesis**

Tsugita, A.; Fraenkel-Conrat, H.; Nirenberg, M.W.; Matthaei, J.H. *Proc. Natl. Acad. Sci. USA* **1962**, 48, 846

Matthaei, J.H.; Jones, O.W.; Martin, R.G.; Nirenberg, M.W. *Proc. Natl. Acad. Sci. USA* **1962**, 48, 666

Martin, R.G.; Matthaei, J.H.; Jones, O.W.; Nirenberg, M.W. *Biochem. Biophys. Res. Commun.* **1962**, 6, 410

### **Discovery of recombinant DNA**

Berg, P.; Ofengand, E.J. *Proc. Natl. Acad. Sci. USA* **1958**, 44, 78

Chamberlin, M.; Berg, P. *Proc. Natl. Acad. Sci. USA* **1962**, 48, 81

Jackson, D.A.; Symons, R.H.; Berg, P. *Proc. Natl. Acad. Sci. USA* **1972**, 69, 2904

Berg, P. *Science* **1981**, 213, 296

### **Discovery of rotation of plane polarized light due to optically active solutions (discovery of optical activity)**

Biot, J.B. *Mem. Acad. Sci. Inst.* **1819**, 2, 41

Biot, J.B. *Bull. Soc. Philomat.* **1815**, 190

Biot, J.B. *Mem. Cl. Sci. Math. Phys. Inst. Imp. Fr.* **1812**, 13, 1

### **Discovery of relationship between handedness of hemihedral quartz crystals and sense of optical rotation**

Herschel, J.F.W. *Trans. Cambridge Phil. Soc.* **1822**, 1, 43

### **Discovery of induced optical activity on an optically inactive sample by applying a magnetic field**

Faraday, M. *Phil. Mag.* **1846**, 28, 294

### **Discovery of rotational barrier in ethane**

Kemp, J.D.; Pitzer, K.S. *J. Chem. Phys.* **1936**, 4, 749

Kemp, J.D.; Pitzer, K.S. *J. Am. Chem. Soc.* **1937**, 59, 276

### **Discovery of sedimentation equilibrium**

Perrin, J. *Compt. Rend.* **1908**, 146, 967

Perrin, J. *Compt. Rend.* **1909**, 147, 475; 530

Perrin, J. *Ann. Chim. Phys.* **1910**, 18, 5

Perrin, J. *J. Physique* **1910**, 9, 5

Perrin, J. *Ion* **1911**, 2, 257

Perrin, J.; Bjerrum, N. *Compt. Rend.* **1911**, 152, 1569

Perrin, J. *Compt. Rend.* **1911**, 152, 1165

Perrin, J. *Compt. Rend.* **1911**, 152, 1380

Perrin, J. *Chem. News* **1913**, 106, 189; 203; 215

### **Discovery of silanes**

Stock, A.; Sommski, K. *Chem. Ber.* **1916**, 49, 111

Stock, A. *Z. Elektrochem. Angew. Physik. Chem.* **1926**, 32, 341

### **Discovery of Streptomycin**

Schatz, A.; Bugie, E.; Waksman, S.A. *Proc. Soc. Exptl. Biol. Med.* **1944**, 55, 66

Schatz, A.; Waksman, S.A. *Proc. Soc. Exptl. Biol. Med.* **1944**, 57, 244

Waksman, S.A. *Science* **1945**, 102, 40

Waksman, S.A.; Schatz, A. *J. Am. Pharm. Assoc. Pract. Pharm. Ed.* **1945**, 6, 308

Waksman, S.A.; Schatz, A. *J. Am. Pharm. Assoc.* **1945**, 34, 273

Waksman, S.A.; Schatz, A.; Reilly, H.C. *J. Bact.* **1946**, 51, 753

Waksman, S.A.; Schatz, A.; Reynolds, D.M. *Ann. NY Acad. Sci.* **1946**, 48, 73

### **Discovery of transfer-RNA**

Altman, S. *Nature New Biology* **1971**, 19, 229

Guerrier-Takada, C.; Gardiner, K.; Marsh, T.; Pace, N.; Altman, S.

*Cell***1983**, 35, 849

Altman, S. *Adv. Enzymology***1989**, 62, 1

Cech, T.R.; Bass, B.L. *Ann. Rev. Biochem.* **1986**, 55, 599

Guerrier-Takada, C.; Lumelsky, N.; Altman, S.

*Science***1989**, 246, 1578

Stark, B.C.; Kole, R.; Bowman, E.J.; Altman, S. *Proc. Natl. Acad. Sci. USA* **1978**, 75, 3717

Vioque, A.; Arnez, J.; Altman, S. *J. Mol. Biol.* **1988**, 202, 835

Cech, T.R. *Scientific American***1986**, 255(5), 64

Cech, T.R. *Ann. Rev. Biochem.* **1990**, 59, 543

Cech, T.R.; Zaug, A.J.; Grabowski, P.J. *Cell***1981**, 27, 487

Zaug, A.J.; Cech, T.R. *Cell***1980**, 19, 331

## Discovery of vitamins

Funk, C. *J. Physiol. (London)* **1911-1912**, 43, 395

### Biotin (vitamin H)

Koegl, F.; Toennis, B. *Z. Physiol. Chem.* **1936**, 242, 43

### Folic acid

Hogan, A.G.; Parrott, E.M. *J. Biol. Chem.* **1940**, 132, 507

Snell, E.E.; Peterson, W.H. *J. Bacteriol.* **1940**, 39, 273

Mitchell, H.K.; Snell, E.E.; Williams, R.J. *J. Am. Chem. Soc.* **1941**, 63, 2284

### Niacin

### Pantothenic acid

Williams, R.J.; Bradway, E.M. *J. Am. Chem. Soc.* **1931**, 53, 783

Snell, E.E.; Strong, F.M.; Peterson, W.H. *Biochem. J.* **1937**, 31, 1789

Williams, R.J.; Truesdail, J.H.; Weinstock, H.H.; Rohrmann, E.; Lyman, C.M.;

McBurney, C.H. *J. Am. Chem. Soc.* **1938**, 60, 2719

Subbarow, Y.; Hitchings, C.H. *J. Am. Chem. Soc.* **1939**, 61, 1615

### Riboflavin (vitamin B<sub>2</sub>, vitamin G)

Osborne, T.B.; Mendel, L.B. *J. Biol. Chem.* **1913**, 15, 311

Warburg, O.; Christian, W. *Biochem. Z.* **1932**, 254, 438

Warburg, O.; Christian, W. *Biochem. Z.* **1933**, 266, 377

Kuhn, R.; Gyorgy, P.; Wagner-Jauregg, T. *Chem. Ber.* **1933**, 66A, 576

Kuhn, R.; Rudy, H. *Chem. Ber.* **1934**, 67A, 1125; 1298

Karrer, P.; Schoepp, K.; Benz, F. *Helv. Chim. Acta* **1935**, 18, 426

Karrer, P.; Schoepp, K.; Pfaehler, K. *Chem. Ber.* **1935**, 68A, 216

Kuhn, R. *Chem. Ber.* **1935**, 68A, 1765

### Vitamin A

Carr, F.H.; Price, E.A. *Biochem. J.* **1926**, 20, 497

Karrer, P.; Helfenstein, A.; Wehrli, H.; Wettstein, A. *Helv. Chim. Acta* **1930**, 13, 1094

Karrer, P.; Morf, R.; Schoepp, K. *Helv. Chim. Acta* **1931**, 14, 1036; 1040; 1431

Karrer, P.; Morf, R. *Helv. Chim. Acta* **1931**, 14, 833

Holmes, H.N.; Corbet, R.E. *J. Am. Chem. Soc.* **1937**, 59, 2042

#### Vitamin B1 (thiamin)

Funk, C. *J. Physiol. (London)* **1911-1912**, 43, 395

Drummond, C. *Biochem. J.* **1920**, 14, 660

Jansen, B.C.P.; Donath, W.F. *Proc. K. Ned. Akad. Wet.* **1926**, 29, 1390

Williams, R.R.; Waterman, R.E.; Karesztesky, J.C.; Buchman, E.R. *J. Am. Chem. Soc.* **1935**, 57, 536

Williams, R.R.; Cline, J.K. *J. Am. Chem. Soc.* **1936**, 58, 1063

Grewe, R. *Z. Physiol. Chem.* **1936**, 242, 89

Karlson, P. *Trends Biochem. Sci.* **1984**, 534

#### Vitamin B6 (Pyridoxine hydrochloride)

Gyorgy, P. *Nature* **1934**, 133, 498

Gyorgy, P. *Biochem. J.* **1935**, 29, 741

Birch, T.W.; Gyorgy, P. *Biochem. J.* **1936**, 30, 304

Lepkovsky, S. *Science* **1938**, 87, 169

Lepkovsky, S. *J. Biol. Chem.* **1938**, 124, 125

Gyorgy, P. *J. Am. Chem. Soc.* **1938**, 60, 983

Kuhn, R.; Wendt, G. *Chem. Ber.* **1938**, 71, 780; 1118

Harris, S.A.; Folkers, K. *Science* **1939**, 89, 347

Harris, S.A.; Stiller, E.T.; Folkers, K. *J. Am. Chem. Soc.* **1939**, 61, 1245

Kuhn, R.; Westphal, K.; Wendt, G.; Westphal, O. *Naturwissen.* **1939**, 27, 469

Snell, E.E.; Guirard, B.M.; Williams, R.J. *J. Biol. Chem.* **1942**, 143, 519

Snell, E.E. *J. Am. Chem. Soc.* **1944**, 66, 2082

Snell, E.E. *J. Biol. Chem.* **1944**, 154, 313

Snell, E.E. *J. Biol. Chem.* **1945**, 157, 491

#### Vitamin B12

Minot, G.R.; Murphy, W.R. *J. Am. Med. Assoc.* **1926**, 87, 470

Minot, G.R.; Murphy, W.R. *J. Am. Med. Assoc.* **1927**, 89, 759

X-ray structure:

Brink, C.; Hodgkin, D.C.; Lindsey, J.; Pickworth, J.; Robertson, J.H.; White, J.G. *Nature* **1954**, 174, 1169

Hodgkin, D.C. *Bull. Soc. Franc. Mineral. Cryst.* **1955**, 78, 106

Hodgkin, D.C.; Pickworth, J.; Robertson, J.H.; Trueblood, K.N.; Prosen, R.J.;

White, J.G. *Nature* **1955**, 176, 325

Kamper, M.J.; Hodgkin, D.C. *Nature* **1955**, 176, 551

Hodgkin, D.C.; Johnson, A.W.; Todd, A.R. *Chem. Soc. (London)* **1955**, 3, 109

Hodgkin, D.C.; Kamper, J.; Mackay, M.; Pickworth, J.; Trueblood, K.N.; White, J.G. *Nature* **1956**, 178, 64

Hodgkin, D.C.; Kamper, J.; Lindsey, J.; Mackay, M.; Pickworth, J.; Robertson, J.H.; Shoemaker, C.B.; White, J.G.; Prosen, R.J.; Trueblood, K.N. *Proc. Roy. Soc. London* **1957**, A242, 228

#### Synthesis:

Rickes, E.L.; Brink, N.G.; Koniuszy, F.R.; Wood, T.R.; Folkers, K. *Science* **1948**, 107, 396

Rickes, E.L.; Brink, N.G.; Koniuszy, F.R.; Wood, T.R.; Folkers, K. *Science* **1948**, 108, 134

Smith, E.L. *Nature* **1948**, 161, 638

Woodward, R.B. *Pure Appl. Chem.* **1968**, 17, 519

Woodward, R.B. *Pure Appl. Chem.* **1973**, 33, 145

Eschenmoser, A. *Quart. Rev.* **1970**, 24, 366

Eschenmoser, A. *Chem. Soc. Rev.* **1976**, 5, 377

Eschenmoser, A. *Nova Acta Leopoldina* **1982**, 55, 5

Eschenmoser, A.; Wintner, C.E. *Science* **1977**, 196, 1410

#### Vitamin C (ascorbic acid)

Szent-Gyorgi, A. *Biochem. J.* **1928**, 22, 1387

Haworth, W.N.; Hirst, E.L. *J. Chem. Soc. Ind.* **1933**, 52, 645

Szent-Gyorgi, A.; Haworth, W.N. *Nature* **1933**, 131, 24

Reichstein, T.; Gruessner, A.; Oppenauer, R. *Helv. Chim. Acta* **1933**, 16, 561

Haworth, W.N. *Chem. Ind.* **1933**, 52, 482

#### Vitamin E (alpha-tocopherol)

Evans, H.M.; Bishop, K.S. *Science* **1922**, 56, 650

Evans, H.M. *Proc. Natl. Acad. Sci. USA* **1925**, 11, 373

Evans, H.M.; Emerson, O.H.; Emerson, G.A. *J. Biol. Chem.* **1936**, 113, 319

Fernholz, E. *J. Am. Chem. Soc.* **1938**, 60, 700

Karrer, P.; Fritzsche, H.; Ringier, B.H.; Salomon, H. *Helv. Chim. Acta* **1938**, 21, 520

#### Vitamin H

Gyorgi, P.; Melville, D.B.; Burk, D. *Science* **1940**, 91, 243

#### Vitamin K

Dam, H.; Geiger, A.; Glavind, J.; Karrer, P.; Karrer, W.; Rothschild, E.; Salomon, H. *Helv. Chim. Acta* **1939**, 22, 310

Schilling, K.; Dam, H. *Acta Chem. Scand.* **1958**, 12, 347

#### **Discovery of zeolites and water in zeolites**

Friedel, G. *Bull. Soc. Fr. Mineralogie* **1896**, 19, 5; 94; 363

Friedel, G. *Compt. Rend.* **1896**, 122, 948; 1006

Friedel, G. *Bull. Soc. Fr. Mineralogie* **1898**, 21, 5

Friedel, G. *Bull. Soc. Fr. Mineralogie* **1899**, 22, 5; 20; 84

### **Disintegration of the elements**

Rutherford, E. *Phil. Mag.* **1900**, 49, 1

Rutherford, E.; Soddy, F. *Phil. Mag.* **1903**, 5, 576

Rutherford, E. *Phil. Mag.* **1911**, 21, 669

Rutherford, E. *Radio-activity*, Cambridge University Press: Cambridge, 1904

Rutherford, E. *Radioactive Substances and their Radiations*, Cambridge

University Press: Cambridge, 1913

Rutherford, E. *Radioactive Transformations*, Yale University Press: New Haven, 1906

### **Distinction between atoms and molecules**

Cannizzaro, S. *Nuovo Cimento* **1858**, 7, 321

### **Doubling of reaction rate with every 10 degree increment in temperature**

Harcourt, A.V. *J. Chem. Soc.* **1867**, 20, 460

### **Dye laser**

Schaefer, F.P.; Schmidt, W. *Z. Naturforsch. A* **1964**, 19A, 1019

Marowsky, G.; Ringwelski, L.; Schaefer, F.P. *Z. Naturforsch. A* **1972**, 27A, 711

Schaefer, F.P.; Ringwelski, L. *Z. Naturforsch. A* **1973**, 28A, 792

Schaefer, F.P. *Trends Phys. Plenary Lect. Gen. Conf. Eur. Phys. Soc.* **1973**, 287

Basting, D.; Schaefer, F.P.; Steyer, B. *Appl. Phys. (Berlin)* **1974**, 3, 81

Schaefer, F.P. *Top. Curr. Chem.* **1976**, 61, 1

Schaefer, F.P. *Lect. Notes Physics* **1975**, 43, 39

Schaefer, F.P. *Springer Ser. Optical Science* **1976**, 3, 50

Schaefer, F.P. *Laser Chemistry* **1983**, 3, 265

Schaefer, F.P. *Top. Appl. Phys.* **1992**, 70, 19

Schaefer, F.P. *EPA Newsletter* **1993**, 47, 33

### **E1 and E2 mechanisms**

Dhar, M.L.; Hughes, E.D.; Ingold, C.K.; Mandour, A.M.M.; Maw, G.A.; Woolf, L.I.

*J. Chem. Soc.* **1948**, 2093

Hughes, E.D.; MacNulty, B.J. *J. Chem. Soc.* **1937**, 1283

Hughes, E.D.; Ingold, C.K.; Scott, A.D. *J. Chem. Soc.* **1937**, 1271

### **E1cb mechanism**

Hughes, E.D.; Ingold, C.K. *J. Chem. Soc.* **1933**, 523

Hughes, E.D.; Ingold, C.K.; Patel, C.S. *J. Chem. Soc.* **1933**, 526

## Effect of resonance on electronic transitions

Pauling, L. *Proc. Natl. Acad. Sci. USA* **1939**, 25, 577

Lewis, G.N.; Calvin, M. *Chem. Rev.* **1939**, 25, 273

## Electrode kinetics

Eyring, H.; Glasstone, S.; Laidler, K.J. *Trans. Electrochem. Soc.* **1939**, 76,

Laidler, K.J. *J. Chem. Educ.* **1970**, 47, 600

## Electron capture detector

Lovelock, J.E.; Gregory, N.L. *Gas Chromatogr. Intern. Symp.* **1962**, 3, 219

Lovelock, J.E. US 3,247,375 (1966-04019)

Simmonds, P.G.; Fenimore, D.C.; Pettitt, B.C.; Lovelock, J.E.; Zlatkis, A. *Anal. Chem.* **1967**, 39, 1428

Maggs, R.J.; Joynes, P.L.; Davies, A.J.; Lovelock, J.E. *Anal. Chem.* **1971**, 43, 1966

Lovelock, J.E. *J. Chromatogr.* **1974**, 99, 3

Lovelock, J.E.; Watson, A.J. *J. Chromatogr.* **1978**, 158, 123

Lovelock, J.E. *Microbiologia* **1997**, 13, 11

## Electron configuration of atoms (Aufbau principle)

Bohr, N. Z. *Physik* **1922**, 9, 1

Stoner, E.C. *Phil. Mag.* **1924**, 48, 719

## Electron diffraction by crystals

Davisson, C.J.; Germer, L.H. *Phys. Rev.* **1920**, 15, 330

Davisson, C.J.; Pidgeon, H.A. *Phys. Rev.* **1920**, 15, 553

Davisson, C.J.; Kunsman, C.H. *Science* **1921**, 54, 522

Davisson, C.J.; Kunsman, C.H. *Phys. Rev.* **1922**, 19, 534

Davisson, C.J.; Kunsman, C.H. *Phys. Rev.* **1922**, 20, 110

Davisson, C.J.; Kunsman, C.H. *Phys. Rev.* **1923**, 22, 242

Davisson, C.J. *Phys. Rev.* **1923**, 21, 637

Davisson, C.J.; Germer, L.H. *Nature* **1927**, 119, 558

Davisson, C.J.; Germer, L.H. *Phys. Rev.* **1927**, 30, 705

Davisson, C.J.; Germer, L.H. *Proc. Natl. Acad. Sci. USA* **1928**, 14, 317; 619

Davisson, C.J. *J. Franklin Inst.* **1928**, 205, 597

Davisson, C.J.; Germer, L.H. *Phys. Rev.* **1928**, 31, 155

Thomson, G.P. *Proc. Roy. Inst. Gt. Brit.* **1928**, 122, 470

Thomson, G.P. *Phil. Mag.* **1928**, 6[7], 939

Thomson, G.P. *Nature* **1929**, 123, 912

Thomson, G.P. *Proc. Roy. Soc. London* **1929**, A125, 352

Thomson, G.P. *Proc. Roy. Soc. London* **1930**, A128, 649

Thomson, G.P. *Nature* **1930**, 126, 55

Thomson, G.P. *Proc. Roy. Soc. London* **1931**, A133, 1

Davisson, C.J.; Germer, L.H. *Phys. Rev.* **1931**, 38, 124

Thomson, G.P. *Nature* **1935**, 135, 492

### **Electron diffraction of organic substances**

Mark, H.; Wierl, R.Z. *Elektrochem. Angew. Physik. Chem.* **1930**, 36, 675

Mark, H.; Wierl, R. *Naturwissen.* **1930**, 18, 205

Mark, H.; Wierl, R. *Naturwissen.* **1930**, 18, 778

Mark, H.; Wierl, R. *Fortschr. Chem. Physik* **1931**, 21, 1

Mark, H.; Motz, H.; Trillat, J.J. *Naturwissen.* **1935**, 23, 319

### **Electron microscopy**

Muller, K.; Ruska, E. *Mikroskopie* **1969**, 23, 197

Riecke, W.D.; Ruska, E. *Z. Wiss. Mikr.* **1957**, 63, 288

Ruska, E. *Rev. Mod. Phys.* **1987**, 59 (Pt. 1), 627

Ruska, E. *Bioscience Rep.* **1987**, 7, 607

Ruska, E. *Phys. Bl.* **1987**, 43, 271

Nordgren, J.; Agren, H.; Werme, L.O.; Nordling, C.; Siegbahn, K.

*J. Phys. B.* **1976**, 9, 295

### **Electron spin resonance (ESR),**

#### **Electron paramagnetic resonance (EPR)**

Zavoiskii, E.K. *Zh. Eksptl. Teoret. Fiz.* **1947**, 17, 155

Zavoiskii, E.K. *Zh. Eksptl. Teoret. Fiz.* **1947**, 17, 883

Zavoiskii, E.K. *J. Phys. (USSR)* **1947**, 11(2)

Zavoiskii, E.K. *Doklady Akad. Nauk SSSR* **1947**, 57, 887

Zavoiskii, E.K. *Chem. Zentr. (Russian Zone Ed.)* **1949**, 1, 170

Wertz, J.E. *Chem. Rev.* **1955**, 55, 829

Ayscough, P. *Electron Spin Resonance in Chemistry*, Methuen & Co. Ltd:  
London, 1967

### **Electronic theory of organic chemistry**

Allan, J.; Robinson, R. *J. Chem. Soc.* **1926**, 376

Oxford, A.E.; *J. Chem. Soc.* **1926**, 383

Robinson, R.; Smith, J.C. *J. Chem. Soc.* **1926**, 392

Allan, J.; Oxford, A.E.; Robinson, R. *J. Chem. Soc.* **1926**, 411

Lea, T.R.; Robinson, R. *J. Chem. Soc.* **1926**, 903

Ingold, C.K.; Ingold, E.H. *J. Chem. Soc.* **1926**, 1310

### **Electrophilicity/Nucleophilicity**

Fry, H.S., *The Electronic Conception of Valence and the Constitution of Benzene*, Longmans, Green, and Co.: London, 1921

Stieglitz, J.J. *Am. Chem. Soc.* **1922**, 44, 1293

Bronsted, J.N. *Rec. Trav. Chim.* **1923**, 42, 718

Lowry, T.M. *J. Soc. Chem. Ind. (London)* **1923**, 42, 43

Lapworth, A. *Mem. and Proc. Manchester Lit. & Phil. Soc.* **1925**, 69, xviii

Lapworth, A. *Nature* **1925**, 115, 625

Lewis, G.N. *Valence and the Structure of Atoms and Molecules*, Chemical Catalog Co.: New York, 1923, p. 141

Lewis, G.N. *J. Franklin Inst.* **1938**, 226, 293

## Electrophoresis

Tiselius, A. *Clin. Chim. Acta (Amsterdam)*, **1958**, 3, 1

Tiselius, A.; Porath, J.; Albertsson, P.A. *Science* **1963**, 141, 13

Hjerten, S.; Jerstedt, S.; Tiselius, A. *Anal. Biochem.* **1965**, 11, 211; 219

Hjerten, S.; Jerstedt, S.; Tiselius, A. *Anal. Biochem.* **1969**, 27, 108

Tiselius, A.; Hjerten, S.; Jerstedt, S. LKB-Produkter AB, SE328135

(1970/09/07); U.S. 3,616,457 (1971/10/26)

## Electrostatic (field) effect

Eisenschitz, R.; London, F. *Z. Physik* **1930**, 60, 491

London, F. *Z. Physik* **1930**, 63, 245

London, F. *Z. Physik. Chem.* **1930**, B11, 222

## Environmental impact factor as reaction metric

Sheldon, R.A. *Chem. Ind.* **1992**, 903

Sheldon, R.A. *Chemtech* **1994**, March, 39

Sheldon, R.A. *Pure Appl. Chem.* **1994**, 72, 1233

## Enzyme inhibition plots

Dixon, M. *Biochem. J.* **1953**, 55, 170

Dixon, M. *Biochem. J.* **1972**, 129, 197

## Enzyme kinetics

Laidler, K.J. *Can. J. Biochem. Cell Biol.* **1983**, 61, 1208

Laidler, K.J.; Bunting, P.S. *Methods in Enzymology* **1980**, 64B, 227

Ngo, T.T.; Bunting, P.S.; Laidler, K.J. *Can. J. Biochem.* **1975**, 53, 11

Kobayashi, T.; Laidler, K.J. *Biotech. Bioeng.* **1974**, 16, 77

Hijazi, N.H.; Laidler, K.J. *Biochim. Biophys. Acta* **1973**, 315, 209

Hijazi, N.H.; Laidler, K.J. *Can. J. Biochem.* **1973**, 51, 832

Hijazi, N.H.; Laidler, K.J. *Can. J. Biochem.* **1973**, 51, 822

Hijazi, N.H.; Laidler, K.J. *Can. J. Biochem.* **1973**, 51, 815

Hijazi, N.H.; Laidler, K.J. *Can. J. Biochem.* **1973**, 51, 806

Kobayashi, T.; Laidler, K.J. *Biochim. Biophys. Acta* **1973**, 302, 1

Hinberg, I.; Laidler, K.J. *Can. J. Biochem.* **1972**, 50, 1334

Laidler, K.J. *The Chemical Kinetics of Enzyme Action*, Clarendon Press: Oxford, 1958

Laidler, K.J. *Trans. Faraday Soc.* **1956**, 52, 1374

Laidler, K.J. *Disc. Faraday Soc.* **1955**, 20, 83

Ouellet, L.; Laidler, K.J. *Can. J. Chem.* **1956**, 34, 146

Laidler, K.J. *Can. J. Chem.* **1955**, 33, 1614

Laidler, K.J. *Disc. Faraday Soc.* **1950**, 47

Laidler, K.J.; Socquet, I.M. *J. Phys. Colloid Chem.* **1950**, 54, 519

Laidler, K.J.; Hoare, J.P. *J. Am. Chem. Soc.* **1949**, 71, 2699 (urea-urease system)

### Effect of pH

Kaplan, H.; Laidler, K.J. *Can. J. Chem.* **1967**, 45, 539

Laidler, K.J. *Trans. Faraday Soc.* **1955**, 51, 550

Laidler, K.J. *Trans. Faraday Soc.* **1955**, 51, 540

Laidler, K.J. *Trans. Faraday Soc.* **1955**, 51, 528

### Effect of inhibitors

Krupka, R.M.; Laidler, K.J. *Can. J. Chem.* **1959**, 37, 1268

### Effect of temperature

Laidler, K.J.; Peterman, B.F. *Methods in Enzymology* **1979**, 63A, 234

## **Enzyme-substrate Pn nomenclature**

Schechter, I.; Berger, A. *Biochem. Biophys. Res. Commun.* **1967**, 27, 157

## **Existence of stereoisomers**

Meyer, V. *Chem. Ber.* **1890**, 23, 567

Auwers, K.; Meyer, V. *Chem. Ber.* **1890**, 23, 2082

Eiloart, A. *J. Prakt. Chem.* **1891**, 43, 124

Eiloart, A. *Am. Chem. J.* **1891**, 12, 231

## **Experimental verification of tetrahedral asymmetry at carbon**

Fischer, E.; Brauns, F. *Chem. Ber.* **1914**, 47, 3181

Fischer, E. *Ann. Chem.* **1914**, 402, 364

## **Experimental verification of Gibbs phase rule**

Roozeboom, H.W.B. *Rec. Trav. Chim. Pays-Bas* **1887**, 6, 262

## **Factor analysis method**

Weiner, P.H.; Malinowski, E.R.; Levinstone, A.R. *J. Phys. Chem.* **1970**, 74, 4537

Weiner, P.H.; Malinowski, E.R. *J. Phys. Chem.* **1971**, 75, 1207

Malinowski, E.R. *Factor Analysis in Chemistry*, Wiley: New York, 2002

## **First observation of distinct steps in SN1 mechanism**

Mayr, H.; Minegishi, S. *Angew. Chem. Int. Ed.* **2002**, 41, 4493

### Fractionation factor theory

Kresge, A.J., *Pure Appl. Chem.* **1964**, 8, 243

Gold, V., *Adv. Phys. Org. Chem.* **1969**, 7, 259

Kudish, A.I.; Wolf, D.; Steckel, F. *J. Chem. Soc. Faraday Trans. I* **1972**, 68, 2041

### Freezing point depression (Blagden's law)

Watson, R. *Phil. Trans. Roy. Soc.* **1770**, 60, 325

Watson, R. *Phil. Trans. Roy. Soc.* **1771**, 61, 213

Blagden, C. *Phil. Trans. Roy. Soc.* **1788**, 78, 125; 277

### Frontier molecular orbital theory

Fukui, K.; Yonezawa, T.; Shingu, H., *J. Chem. Phys.* **1952**, 20, 722

Fukui, K.; Yonezawa, T.; Nagata, C.; Shingu, H. *J. Chem. Phys.* **1954**, 22, 1433

Fukui, K.; Yonezawa, T.; Nagata, C., *Bull. Chem. Soc. Jpn.* **1954**, 27, 423

Fukui, K.; Yonezawa, T.; Nagata, C., *J. Chem. Phys.* **1957**, 27, 1247

Fukui, K., *Acc. Chem. Res.* **1971**, 4, 57

### Fugacity concept

Lewis, G.N. *Proc. Am. Acad. Arts Sci.* **1901**, 37, 49

Lewis, G.N. *Z. Physik. Chem.* **1901**, 38, 205

### Gauche effect

Wolfe, S. *Acc. Chem. Res.* **1972**, 5, 102

Phillips, L.; Wray, V. *Chem. Commun.* **1973**, 90

### General valence bond theory

Voter, A.F.; Goddard III, W.A., *J. Am. Chem. Soc.* **1986**, 108, 2830

### Group displacement law

Soddy, F. *Chem. News* **1913**, 107, 97

Fajans, K. *Ber.* **1913**, 35, 240

### Heterogeneous catalysis

Laidler, K.J.; Glasstone, S.; Eyring, H. *J. Chem. Phys.* **1940**, 8, 659

Laidler, K.J.; Glasstone, S.; Eyring, H. *J. Chem. Phys.* **1940**, 8, 667

Shuler, K.E.; Laidler, K.J. *J. Chem. Phys.* **1949**, 17, 1212

Shuler, K.E.; Laidler, K.J. *J. Chem. Phys.* **1949**, 17, 1356

Laidler, K.J. *Disc. Faraday Soc.* **1950**, 47

Weber, J.; Laidler, K.J. *J. Chem. Phys.* **1951**, 19, 1089

### Host-guest chemistry

Cram, D.J. *J. Inclusion Phenomena* **1988**, 6, 397

Cram, D.J. *Angew. Chem. Int. Ed. Engl.* **1988**, 27, 1009

Cram, D.J.; Cram, J.M. *Science* **1974**, 183, 803  
Kyba, E.P.; Helgeson, R.C.; Madan, K.; Gokel, G.W.; Tarnowski, T.L.; Moore, S.S.;  
Cram, D.J. *J. Am. Chem. Soc.* **1977**, 99, 2564  
Lehn, J.M. *Structure and Bonding* **1973**, 16, 1  
Lehn, J.M. *Acc. Chem. Res.* **1978**, 11, 49  
Lehn, J.M. *Pure Appl. Chem.* **1979**, 51, 979  
Lehn, J.M. *Angew. Chem. Int. Ed. Engl.* **1990**, 29, 1304  
Lehn, J.M. *Science* **1985**, 227, 849  
Pedersen, C.J. *J. Am. Chem. Soc.* **1967**, 89, 2495; 7017  
Pedersen, C.J.; Frensdorff, H.K. *Angew. Chem. Int. Ed. Engl.* **1972**, 11, 16  
Truter, M.R.; Pedersen, C.J. *Endeavor* **1971**, 30, 142

## Hybridization

Pauling, L., *The Nature of the Chemical Bond and the Structure of Molecules and Crystals*, Cornell University Press: Ithaca, N.Y., 1948, pp. 58 – 75

## Hydrogen bonding

Huggins, M.L., *J. Org. Chem.* **1937**, 1, 407  
Latimer, W.M.; Rodebush, W.H., *J. Am. Chem. Soc.* **1920**, 42, 1419  
Pauling, L.; Brockway, L.O. *Proc. Nat. Acad. Sci.* **1934**, 20, 336

## Hyperconjugation

Wheland, G.W. *J. Chem. Phys.* **1934**, 2, 474  
Dewar, M.J.S., *Hyperconjugation*, Ronald Press: New York, 1962

## Inductive effect

Lewis, G.N., *Valence and the Structure of Atoms and Molecules*, ACS Monograph, The Chemical Catalog Co.: New York, 1923, p. 139  
Lowry, T.M. *J. Chem. Soc.* **1923**, 123, 822; 1886  
Lowry, T.M. *Nature* **1925**, 114, 376  
Ingold, C.K.; Ingold, E.H. *J. Chem. Soc.* **1926**, 1310  
Ingold, C.K.; Shaw, F.R. *J. Chem. Soc.* **1927**, 2918  
Ingold, C.K. *J. Chem. Soc.* **1933**, 1120

## Infrared spectroscopy

Coblentz, W.W. *Investigations of Infra-Red Spectra*, Parts I - VII, Carnegie Institution of Washington, 1905 - 1908  
Coblentz, W.W. *Phys. Rev.* **1905**, 20, 273; 337  
Coblentz, W.W. *Phys. Rev.* **1906**, 20, 1  
Coblentz, W.W. *Phys. Rev.* **1906**, 23, 125  
Bell, F.K. *J. Am. Chem. Soc.* **1925**, 47, 2192; 2811; 3039  
Gillette, R.H.; Daniels, F. *J. Am. Chem. Soc.* **1936**, 58, 1139; 1143  
Hendricks, S.B.; Wulf, O.R.; Hilbert, G.E.; Liddell, U.

*J. Am. Chem. Soc.* **1936**, 58, 1991

Buswell, A.M.; Deitz, V.; Rodebush, W.H. *J. Chem. Phys.* **1937**, 5, 84

### **Interpretation of pH rate profiles as straight-line segments**

Dixon, M. *Biochem. J.* **1953**, 55, 161

### **Intimate and solvent separated ion pairs**

Cram, D.J. *J. Am. Chem. Soc.* **1952**, 74, 2129

Winstein, S.; Schreiber, K. *J. Am. Chem. Soc.* **1952**, 74, 2165

Denney, D.B.; Goldstein, B. *J. Am. Chem. Soc.* **1957**, 79, 4948

Goering, H.L.; Levy, J.F. *J. Am. Chem. Soc.* **1962**, 84, 3853

### **Ion exchange resins**

Adams, B.A.; Holmes, E.L. *J. Soc. Chem. Ind.* **1935**, 54, 1T

### **Ionization theory**

Arrhenius, S. *Z. Physik. Chem.* **1887**, 1, 631

### **Isomer enumeration**

Cayley, A. *Phil. Mag.* **1854**, 7, 40

Cayley, A. *Phil. Mag.* **1857**, 13, 172

Cayley, A. *Phil. Mag.* **1859**, 18, 374

Crum Brown, A. *Trans. Roy. Soc. Edinburgh* **1864**, 23, 707

Cayley, A. *Phil. Mag.* **1874**, 47, 444

Cayley, A. *Chem. Ber.* **1875**, 8, 1056

Cayley, A. *Rept. Brit. Assoc. Adv. Sci.* **1875**, 257

Cayley, A. *Phil. Mag.* **1877**, 3, 34

Cayley, A. *Am. J. Math.* **1881**, 4, 266

Henze, H.R.; Blair, C.M. *J. Am. Chem. Soc.* **1931**, 53, 3077

Polya, G. *Acta Math.* **1936**, 68, 145

### **Isostere concept**

Langmuir, I. *J. Am. Chem. Soc.* **1919**, 41, 1543

Mulliken, R. *Phys. Rev.* **1928**, 32, 186

Hund, F. *Z. Physik* **1928**, 51, 759

### **Isotope concept**

Soddy, F. *J. Chem. Soc.* **1911**, 99, 72

### **Isotope effect**

Reitz, O. *Z. Physik. Chem.* **1936**, A177, 85

Reitz, O. *Naturwissenschaften* **1936**, 24, 814

Reitz, O. *Z. Elektrochem.* **1937**, 43, 659

Reitz, O. Z. *PhysikChem.* **1937**, A179, 119  
Reitz, O. Z. *Elektrochem.* **1938**, 44, 72; 693  
Reitz, O. Z. *Elektrochem.* **1939**, 45, 100  
Reitz, O. Z. *PhysikChem.* **1939**, A183, 371  
Reitz, O.; Kopp, J. Z. *PhysikChem.* **1939**, A184, 429

### Isotopic exchange

Urey, C.; Grieff, L.J. *J. Am. Chem. Soc.* **1935**, 57, 321  
Webster, L.A.; Wahl, M.H.; Urey, H.C. *J. Chem. Phys.* **1935**, 3, 129

### Isotopic labelling experiment

Rittenberg, D.; Bleakney, W.; Urey, H.C. *J. Chem. Phys.* **1934**, 2, 48  
Schoenheimer, R.; Rittenberg, D. *J. Biol. Chem.* **1935**, 111, 163  
Schoenheimer, R.; Rittenberg, D.; Graff, M. *J. Biol. Chem.* **1935**, 111, 183  
Ives, D.J.G.; Rydon, H.N. *J. Chem. Soc.* **1935**, 1735  
Hughes, E.D.; Juliusburger, F.; Masterman, S.; Topley, B.; Weiss, J.  
*J. Chem. Soc.* **1935**, 1525  
Ingold, C.K.; de Salas, E.; Wilson, C.L. *J. Chem. Soc.* **1936**, 1328  
Ives, D.J.G. *J. Chem. Soc.* **1938**, 81  
Ives, D.J.G.; Wilks, G.C. *J. Chem. Soc.* **1938**, 1455  
Schoenheimer, R.; Rittenberg, D. *Science* **1938**, 87, 221  
Ives, D.J.G.; Kerlogue, R.H. *J. Chem. Soc.* **1940**, 1362  
Schoenheimer, R.; Rittenberg, D. *Physiol. Rev.* **1940**, 20, 218  
Kohler, R.E., Jr. *Historical Studies in the Physical Sciences* **1977**, 8, 257

### Kinetics of adsorption

Langmuir, I. *J. Am. Chem. Soc.* **1916**, 38, 2221

### Laser drop experiment

Banks, J.T.; Scaiano, J.C. *J. Am. Chem. Soc.* **1993**, 115, 6409

### Laser spectroscopy

Bloembergen, N. *Comments Solid State Phys.* **1969**, 2, 119  
Bloembergen, N. *Lect. Notes Phys.* **1975**, 43, 31  
Bloembergen, N. *Ann. N.Y. Acad. Sci.* **1976**, 267, 51  
Haensch, T.W.; Shahin, I.S.; Schawlow, A.L. *Phys. Rev. Lett.* **1971**, 27, 707  
Haensch, T.W.; Shahin, I.S.; Schawlow, A.L. *Nature* **1972**, 235, 63  
Sorem, M.S.; Levenson, M.D.; Schawlow, A.L. *Phys. Lett. A* **1971**, 37, 33  
Schawlow, A.L. *Science* **1978**, 141  
Schawlow, A.L. *Science* **1982**, 217, 9  
Schawlow, A.L. *Rev. Mod. Phys.* **1982**, 54, 697  
Schawlow, A.L. *Prix Nobel* **1981**, 88  
Schawlow, A.L. *Proc. Int. Conf. Lasers* **1982**, 1  
Schawlow, A.L. *AIP Conf. Proc.* **1988**, 169, 26

## Latent and specific heat

Black, J. *Lectures on the Elements of Chemistry*, 1803

Kirchhoff, G. *Ann. Physik* **1858**, 103, 177

## Law of isomorphism

Mitscherlich, E. *Ann. Chim.* **1822**, 19, 350

Mitscherlich, E. *Quart. J. Sci.* **1823**, 14, 198; 415

## Law of mass action

Waage, P.; Gulberg, C. *Forhandlinger i Videnskabselskabet i Christiana* **1864**, 7, 35

Harcourt, A.V.; Esson, W. *Phil. Trans. Roy. Soc. London* **1866**, 156, 193

Harcourt, A.V.; Esson, W. *Phil. Trans. Roy. Soc. London* **1867**, 157, 117

Harcourt, A.V. *J. Chem. Soc.* **1867**, 20, 460

Van't Hoff, J.H. *Z. Physik. Chem.* **1887**, 1, 481

Harcourt, A.V.; Esson, W. *Phil. Trans. Roy. Soc. London* **1895**, 186A, 817

## Law of osmotic pressure

Van't Hoff, J.H., *Phil. Mag.* **1888**, 26, 81

## Laws of chemical kinetics and rate laws

Wilhelmy, L.F. *Ann. Physik* **1850**, 81, 413; 499

Van't Hoff, J.H. *Vorlesungen ueber Theoretische und Physikalische Chemie*, Friedrich Viewig und Sohn: Braunschweig, 1898

Van't Hoff, J.H. *Etudes de Dynamique Chimique*, Frederik Muller & Co.: Amsterdam, 1884

Van't Hoff, J.H. *Leçons de Chimie Physique*, 1re Partie, Hachette: Paris, 1860 - 1869

## Ligand field theory

Ballhausen, C.J. *J. Chem. Educ.* **1979**, 56, 215; 294; 357

## Linear combination of atomic orbitals (LCAO)

Lennard-Jones, J.E. *Trans. Faraday Soc.* **1929**, 25, 668

## Liquid-liquid and gas-liquid chromatography

Martin, A.J.P.; Synge, R.L.M. *Biochem. J.* **1941**, 35, 1358

James, A.T.; Martin, A.J.P. *Biochem. J.* **1952**, 50, 679

## Liquification of Helium

Onnes, H.K. *Chem. Ztg.* **1908**, 32, 901

Onnes, H.K. *Proc. Acad. Amsterdam* **1909**, 10, 744

Onnes, H.K. *K. Akad. Wetenschappen Amsterdam* **1910**, 11, 168

Onnes, H.K. *van Bemmelen Gedenkboek* **1911**, 441

Onnes, H.K.; Crommelin, C.A. *Proc. Acad. Wetenschappen Amsterdam* **1911**, 13, 614; 1093

Onnes, H.K. *Proc. Acad. Wetenschappen Amsterdam* **1913**, 14, 818

## Linear Free Energy Relationships

Bronsted, J.N.; Pedersen, K. *Z. Physik. Chem.* **1924**, 108, 185

Hammett, L.P. *Chem. Rev.* **1935**, 17, 125

Wells, P.G. *Chem. Rev.* **1963**, 63, 171

## Magic or super acid

Gillespie, R.J. *Acc. Chem. Res.* **1968**, 1, 202

Gillespie, R.J.; Pez, G.P. *Inorg. Chem.* **1969**, 8, 1233

Gillespie, R.J. *Can. Chem. Educ.* **1969**, 4, 9

Olah, G.A.; Commeyras, A. *J. Am. Chem. Soc.* **1969**, 91, 2929

Olah, G.A.; Ku, A.T.; Olah, J.A. *J. Org. Chem.* **1970**, 35, 3925

Gillespie, R.J.; Peel, T.E. *Adv. Phys. Org. Chem.* **1971**, 9, 1

Gillespie, R.J.; Peel, T.E.; Robinson, E.A. *J. Am. Chem. Soc.* **1971**, 93, 5083

Olah, G.A.; Szilagyi, P.J. *J. Org. Chem.* **1971**, 36, 1121

Olah, G.A.; Ku, A.T.; Olah, J.A. *J. Org. Chem.* **1971**, 36, 3582

Olah, G.A.; McFarland, C.W. *Inorg. Chem.* **1972**, 11, 845

Gillespie, R.J.; Morton, M.J. *Inorg. Chem.* **1972**, 11, 591

Gillespie, R.J.; Morton, M.J. *Inorg. Chem.* **1972**, 11, 586

Gillespie, R.J. *Endeavour* **1973**, 32, 3

Gillespie, R.J.; Peel, T.E. *J. Am. Chem. Soc.* **1973**, 95, 5173

Gillespie, R.J. *Proton Transfer React.* **1975**, 1

Gillespie, R.J.; Liang, J. *J. Am. Chem. Soc.* **1988**, 110, 6053

Gillespie, R.J. *Can. Chem. News* **1991**, 43, 20

## Mass spectrometry

Aston, F.W., *Isotopes*, E. Arnold: London, 1922

Aston, F.W. *Mass Spectra and Isotopes*, London, 1933

Aston, F.W. *Phil. Mag.* **1919**, 38, 707

Demptster, A.J. *Phys. Rev.* **1918**, 11, 316

Aston, F.W., *Nature* **1936**, 137, 357

Aston, F.W., *The London Edinburgh, and Dublin Phil. Mag.* **1920**, 40, 628

## Matrix isolation spectroscopy

Whittle, E.; Dows, D.A.; Pimentel, G.C. *J. Chem. Phys.* **1954**, 22, 1943

Becker, E.D.; Pimentel, G.C. *J. Chem. Phys.* **1954**, 25, 224

Norman, I.; Porter, G. *Nature* **1954**, 174, 58

### **Mesomeric (resonance) effect**

Ingold, C.K., *Structure and Mechanism in Organic Chemistry*, 2<sup>nd</sup> ed., Cornell University Press: Ithaca, 1969, p. 72ff, 87

Ingold, C.K., *Chem. Rev.* **1934**, 15, 225

Allan, J.; Oxford, A.E.; Robinson, R.; Smith, J.C. *J. Chem. Soc.* **1926**, 401

Arndt, F.; Scholz, E.; Nachtwey, P. *Ber.* **1924**, 57, 1904

Arndt, F. *Ber.* **1930**, 63, 2963

Lucas, H.J.; Jameson, A.Y., *J. Am. Chem. Soc.* **1924**, 46, 2475

### **Microanalytical methods for organic substances**

Pregl, F. *Die quantitative organische Mikroanalyse*, 3<sup>rd</sup> ed.; Julius Springer: Berlin, 1930

Pregl, F.; Fyleman, E. *Quantitative Organic Microanalysis*, P. Blakiston's Son: Philadelphia, 1930

### **Molecular mechanics calculations**

Allinger, N.L.; Miller, M.A.; van Catledge, F.A.; Hirsch, J.A.

*J. Am. Chem. Soc.* **1967**, 89, 4345

### **Multiwavelength anomalous dispersion (MAD)**

Karle, J. *Acta Crystal. A* **1984**, 40A, 366

Pahler, A.; Smith, J.L.; Hendrickson, W.A. *Acta Crystal. A* **1990**, 46A, 537

### **Mutarotation of sugars**

Hudson, C.S. *Z. Phys. Chem.* **1903**, 44, 487

Hudson, C.S. *J. Am. Chem. Soc.* **1904**, 26, 1065

Hudson, C.S. *Z. Phys. Chem.* **1904**, 50, 273

Hudson, C.S. *J. Am. Chem. Soc.* **1907**, 29, 1571

Hudson, C.S. *J. Am. Chem. Soc.* **1910**, 32, 889

Hudson, C.S.; Dale, J.K. *J. Am. Chem. Soc.* **1917**, 39, 320

Bronsted, J.N.; Guggenheim, E.A. *J. Am. Chem. Soc.* **1927**, 49, 2554

Westheimer, F.H. *J. Org. Chem.* **1938**, 2, 431

### **No-barrier multi-dimensional Marcus theory**

Guthrie, J.P. *Can. J. Chem.* **2005**, 83, 1

Guthrie, J.P. *ChemPhysChem* **2003**, 4, 809

Guthrie, J.P.; Pitchko, V. *J. Am. Chem. Soc.* **2000**, 122, 5520

Guthrie, J.P. *J. Am. Chem. Soc.* **2000**, 122, 5529

Guthrie, J.P. *Can. J. Chem.* **1999**, 77, 934

Guthrie, J.P. *J. Am. Chem. Soc.* **1998**, 120, 1688

Guthrie, J.P. *J. Am. Chem. Soc.* **1997**, 119, 1151

Guthrie, J.P. *J. Am. Chem. Soc.* **1996**, 118, 12878

Guthrie, J.P. *Can. J. Chem.* **1996**, 74, 1283

## Non-equilibrium thermodynamics

Prigogine, I. *Introduction to Thermodynamics of Irreversible Processes*, Wiley: New York, 1962

Glansdorff, P.; Prigogine, I. *Thermodynamic Theory of Structure, Stability and Fluctuations*, Wiley-Interscience: New York, 1971

Nicolis, G.; Prigogine, I. *Self-organization in Non-equilibrium Systems*, Wiley: New York, 1977

Prigogine, I. *Non-equilibrium Statistical Mechanics*, Interscience: New York, 1962

## Normal salt effect

Bateman, L.C.; Church, M.G.; Hughes, E.D.; Ingold, C.K.; Taher, N.A. *J. Chem. Soc.* **1940**, 979

Fainberg, A.H.; Winstein, S. *J. Am. Chem. Soc.* **1956**, 78, 2763

Winstein, S.; Klinedinst, Jr., P.E.; Robinson, G.C. *J. Am. Chem. Soc.* **1961**, 83, 885

Huisgen, R. *Angew. Chem. Int. Engl. Ed.* **1970**, 9, 751

## Nuclear fission

Meitner, L. *Naturwissenschaften* **1934**, 22, 759

Hahn, O.; Meitner, L. *Naturwissenschaften* **1935**, 23, 37; 230; 320

Hahn, O.; Meitner, L.; Strassmann, F. *Naturwissenschaften* **1935**, 23, 544

Hahn, O.; Meitner, L.; Strassmann, F. *Chem. Ber.* **1936**, 69B, 905

Meitner, L.; Hahn, O. *Naturwissenschaften* **1936**, 24, 158

Hahn, O.; Meitner, L.; Strassmann, F. *Chem. Ber.* **1937**, 70B, 1374

Meitner, L.; Hahn, O.; Strassmann, F. *Z. Physik* **1937**, 106, 249

Hahn, O.; Meitner, L.; Strassmann, F. *Naturwissenschaften* **1938**, 26, 475

Hahn, O.; Meitner, L. *Scientia* **1938**, 63, 12

Hahn, O. *Ann. Physik* **1939**, 36, 368

Hahn, O.; Strassmann, F. *Naturwissenschaften* **1939**, 27, 11; 89; 163

Hahn, O.; Strassmann, F. *Physik. Z.* **1939**, 40, 673

Meitner, L.; Frisch, O.R. *Nature* **1939**, 143, 239; 471

Bohr, N.; Wheeler, J. *Phys. Rev.* **1939**, 56, 426

Hahn, O.; Strassmann, F. *Naturwissenschaften* **1940**, 28, 455

Hahn, O.; Strassmann, F. *Forschung u. Fortschr.* **1940**, 16, 31

Hahn, O. *Scientia* **1941**, 68, 8

Hahn, O. *Chem. Ztg.* **1942**, 66, 317

Hahn, O.; Strassmann, F. *Naturwissenschaften* **1943**, 31, 499

Meitner, L. *Rev. Modern Phys.* **1945**, 17, 287

## Nuclear magnetic resonance

Purcell, E.M.; Torrey, H.C.; Pound, R.V. *Phys. Rev.* **1946**, 69, 37

Block, F.; Hansen, W.W.; Packard, M. *Phys. Rev.* **1946**, 69, 127

## Nuclear shell model

- Mayer, M.G. *Phys. Rev.* **1949**, 75, 1969  
Mayer, M.G. *Phys. Rev.* **1950**, 78, 16; 22  
Mayer, M.G.; Moszkowski, S.A.; Nordheim, L.W. *Rev. Modern Phys.* **1951**, 23, 315  
Mayer, M.G.; Jensen, J.H.D. *Elementary Theory of Nuclear Shell Structure*, Wiley: New York, 1955  
Mayer, M.G. *Angew. Chem.* **1964**, 76, 729

## Octant rule

- Moffit, W.; Woodward, R.B.; Moscovitz, A.; Klyne, W.; Djerassi, C. *J. Am. Chem. Soc.* **1961**, 83, 4013  
Moffit, W. *J. Chem. Phys.* **1956**, 25, 467

## Octet rule

- Lewis, G.N., *J. Am. Chem. Soc.* **1916**, 38, 762  
Lewis, G.N., *Valence and the Structure of Atoms and Molecules*, ACS Monograph, The Chemical Catalog Co.: New York, 1923.  
Langmuir, I., *J. Am. Chem. Soc.* **1916**, 38, 2221  
Langmuir, I., *J. Am. Chem. Soc.* **1919**, 41, 868; 1543  
Langmuir, I., *J. Am. Chem. Soc.* **1920**, 42, 274

## Ortho effect

- Kehrmann, F. *Chem. Ber.* **1888**, 21, 3315

## Oxidation numbers

- Johnson, O.C. *Chem. News* **1880**, 42, 51

## Partition functions

- Herzfeld, K.F. *Kinetische Theorie der Wärme*, Braunschweig, 1925  
Giauque, W.F. *J. Am. Chem. Soc.* **1930**, 52, 4808  
Eyring, H. *J. Chem. Phys.* **1935**, 3, 107  
Halford, J.O.J. *J. Chem. Phys.* **1934**, 2, 694  
Eidenhoff, M.L.; Aston, J.G. *J. Chem. Phys.* **1935**, 3, 379

## Peptide Protein Structure

- Fischer, E.; Fournneau, E. *Chem. Ber.* **1901**, 34, 2868  
Fischer, E. *Chem. Z.* **1902**, 26, 939  
Hofmeister, F. *Naturwiss. Rundschau* **1902**, 17, 529; 545  
Vickery, H.B.; Osborne, T.B. *Physiol. Rev.* **1928**, 8, 393

## Peroxide effect (radical chemistry)

- Kharasch, M.S.; Mayo, F.R. *J. Am. Chem. Soc.* **1933**, 55, 2468

Kharasch, M.S.; Mayo, F.R. *J. Am. Chem. Soc.* **1938**, 60, 3097

Hey, D.H.; Waters, W.A. *Chem. Rev.* **1937**, 21, 169

Kharasch, M.S.; Englemann, H.; Mayo, F.R. *J. Org. Chem.* **1937**, 2, 288

## **Perturbational Molecular Orbital (PMO) Method**

Dewar, M.J.S. *The PMO Theory of Organic Chemistry*, Plenum: New York, 1976

Dewar, M.J.S. *J. Am. Chem. Soc.* **1952**, 74, 3341

Dewar, M.J.S.; Longuet-Higgins, H.C. *Proc. Roy. Soc. London* **1952**, 214A, 482

Dewar, M.J.S. *J. Am. Chem. Soc.* **1952**, 74, 3345; 3350; 3353; 3355; 3357

Dewar, M.J.S. *Science Progress* **1952**, 40, 604

Dewar, M.J.S.; Pettit, R.J. *Chem. Soc. Abstracts* **1954**, 1617

Dewar, M.J.S.; Pettit, R.J. *Chem. Soc. Abstracts* **1954**, 1625

## **pH indicators**

White, E.C.; Acree, S.F. *J. Am. Chem. Soc.* **1917**, 39, 648

Lubs, H.A.; Clark, W.M. *J. Wash. Acad. Sci.* **1915**, 5, 609

Lubs, H.A.; Clark, W.M. *J. Wash. Acad. Sci.* **1916**, 6, 481

## **Phase contrast microscopy**

Zernike, F. *Monthly Not. R.A.S.* **1934**, 94, 377

Zernike, F. *Physica* **1934**, 1, 689

Zernike, F. *Z. Techn. Phys.* **1935**, 16, 454

Reumuth, H. *Kolloid Z.* **1949**, 115, 44

## **Photoaffinity labelling**

Singh, A.; Thornton, E.R.; Westheimer, F.H. *J. Biol. Chem.* **1962**, 237, 3006

Bayley, H.; Knowles, J.R. *Methods Enzymol.* **1977**, 46, 69

## **Photoelectric effect**

Einstein, A. *Ann. Physik* **1905**, 17, 132

Hertz, H. *Ann. Physik* **1887**, 31, 983

Lenard, P. *Ann. Physik* **1902**, 8, 149

Richardson, O.W.; Compton, K.T. *Phil. Mag.* **1912**, 24, 575

Hughes, L. *Phil. Trans. Roy. Soc. London* **1912**, 212, 205

Millikan, R.A. *Phys. Rev.* **1916**, 7, 362

## **Photosynthesis**

Ingen-Housz, J. *Experiments Upon Vegetables Discovering Their Great Power of Purifying the Common Air in the Sunshine and of Injuring it in the Shade and at Night, to which is Joined, a New Method of Examining the Accurate Degree of Salubrity of the Atmosphere*, London, 1779

Ingen-Housz, J. *Phil. Trans. Roy. Soc.* **1782**, 72, 426

Ingen-Housz, J. *J. Physique Theorique et Appliquee* **1784**, 24, 337

Ingen-Housz, J. *J. Physique Theorique et Appliquee* **1784**, 25, 3

Ingen-Housz, J.J. *Physique Theorique et Appliquee* **1784**, 25, 78

Ingen-Housz, J.J. *Physique Theorique et Appliquee* **1784**, 25, 437

Ingen-Housz, J.J. *Physique Theorique et Appliquee* **1789**, 34, 436

## **Polarography**

Holleck, L.; Heyrovsky, M.; Vavricka, S.J. *Electroanal. Chem. Interfacial Electrochem.* **1968**, 17, 293

Heyrovsky, M.; Zuman, P. *Practical Polarography: An Introduction for Chemistry Students*, Academic Press: New York, 1968

## **Polymer chemistry**

Staudinger, H.; Fritschi, J. *Helv. Chim. Acta* **1922**, 5, 785

Staudinger, H. *From Organic Chemistry to Macromolecules, A Scientific Autobiography*, Wiley: New York, 1961

## **Polymerase chain reaction (PCR) method**

Mullis, K.; Faloona, F.; Scharf, S.; Saiki, R.; Horn, G; Erlich, H. *Cold Spring Harbor Symp. Quant. Biol.* **1986**, 51, 260

## **Potential energy surfaces**

Marcelin, R. *J. Chim. Phys.* **1913**, 10, 1913

Marcelin, R. *Compt. Rend.* **1914**, 158, 116

Marcelin, R. *Compt. Rend.* **1914**, 158, 407

Marcelin, R. *Ann. Physique* **1915**, 3, 120

## **Prebiotic synthesis of amino acids and biologically important molecules**

Miller, S.L. *Science* **1953**, 117, 528

Miller, S.L. *J. Am. Chem. Soc.* **1955**, 77, 2351

Miller, S.L. *Biochim. Biophys. Acta* **1957**, 23, 480

Miller, S.L.; Urey, H.C. *Science* **1959**, 130, 245

## **Principle of least motion**

Rice, F.O.; Teller, E.J. *Chem. Phys.* **1938**, 6, 489

Rice, F.O.; Teller, E.J. *Chem. Phys.* **1939**, 7, 199

Miller, S.I. *Adv. Phys. Org. Chem.* **1968**, 6, 185

Tee, O.S. *J. Am. Chem. Soc.* **1969**, 91, 7144

Tee, O.S.; Yates, K. *J. Am. Chem. Soc.* **1972**, 94, 3074

Tee, O.S.; Altmann, J.A.; Yates, K. *J. Am. Chem. Soc.* **1974**, 96, 3141

Altmann, J.A.; Tee, O.S.; Yates, K. *J. Am. Chem. Soc.* **1976**, 98, 7132

### **Principle of microscopic reversibility**

Ingold, C.K., *Structure and Mechanism in Organic Chemistry*, 2<sup>nd</sup> ed., Cornell University Press: Ithaca, 1969, p. 250 – 251

### **Principle of nonperfect synchronization**

Bernasconi, C.F. *Tetrahedron* **1985**, 41, 3219

Bernasconi, C.F.; Bunnell, R.D. *Isr. J. Chem.* **1985**, 26, 420

Bernasconi, C.F. *Acc. Chem. Res.* **1987**, 20, 301

Bernasconi, C.F. *Adv. Chem. Ser.* **1987**, 215, 115

### **Principle of solubility product**

Nernst, H.W. *Z. Physik. Chem.* **1889**, 4, 372

### **Probe technique for observing spectroscopically "invisible" transients**

Small, R.D. Jr.; Scaiano, J.C. *Chem. Phys. Lett.* **1977**, 48, 354

Small, R.D. Jr.; Scaiano, J.C. *J. Am. Chem. Soc.* **1978**, 100, 296

Paul, H.; Small, R.D. Jr.; Scaiano, J.C. *J. Am. Chem. Soc.* **1978**, 100, 4520

Scaiano, J.C. *Acc. Chem. Res.* **1982**, 15, 252

### **Protecting groups in organic synthesis**

#### **Cbz (carbobenzyloxy)**

Bergmann, M.; Zervas, L. *Chem. Ber.* **1932**, 65, 1192

#### **t-Boc (t-butoxycarbonyl)**

McKay, F.C.; Albertson, N.F. *J. Am. Chem. Soc.* **1957**, 79, 4686

Anderson, G.W.; McGregor, A.C. *J. Am. Chem. Soc.* **1957**, 79, 6180

Carpino, L.A. *J. Am. Chem. Soc.* **1960**, 82, 2527

Carpino, L.A.; Parameswaran, K.N.; Kirkley, R.K.; Spiewak, J.W.; Schmitz, E. *J. Org. Chem.* **1970**, 35, 3291

#### **Fmoc (fluorenylmethoxycarbonyl)**

Carpino, L.A.; Han, G.Y. *J. Am. Chem. Soc.* **1970**, 92, 5748

Carpino, L.A.; Han, G.Y. *J. Org. Chem.* **1972**, 37, 3404

### **Protein measurement method (most cited paper ever, more than 250,000 citations)**

Lowry, O.H.; Rosebrough, N.J.; Farr, A.L.; Randall, R.J. *J. Biol. Chem.* **1951**, 193, 265

### **Protein structures (alpha-helix; beta-sheet; kinks)**

Pauling, L.; Corey, R.B. *J. Am. Chem. Soc.* **1950**, 72, 5349

Pauling, L.; Corey, R.B. *Proc. Natl. Acad. Sci. USA* **1951**, 37, 235; 251; 261; 272; 282; 729

Pauling, L.; Corey, R.B.; Branson, H.R. *Proc. Natl. Acad. Sci. USA* **1951**, 37, 205

Pauling, L.; Corey, R.B. *Nature* **1951**, 168, 550

Pauling, L.; Corey, R.B. *Proc. Natl. Acad. Sci. USA* **1952**, 38, 86

Corey, R.B.; Pauling, L. *Proc. Roy. Soc. London* **1953**, B141, 1

Pauling, L.; Corey, R.B. *Nature* **1953**, 171, 59

Pauling, L.; Corey, R.B. *Fortsch. Chem. Org. Naturstoffe* **1953**, 10, 180

Pauling, L.; Corey, R.B. *Proc. Natl. Acad. Sci. USA* **1953**, 39, 247; 253

Pauling, L.; Corey, R.B.; Yakel, H.L. Jr. *Acta Cryst.* **1955**, 8, 853

### Proton inventory technique

Schowen, K.B.; Schowen, R.L. *Methods Enzymol.* **1982**, 87C, 551

Venkatasubban, K.S.; Schowen, R.L. *CRC Crit. Rev. Biochem.* **1984**, 17, 1

### Proton pump

Sachs, G.; Spenny, J.G.; Shoemaker, R.L.; Goodall, M.C. *Experimental Eye Res.* **1973**, 16, 241

Sachs, G.; Chang, H.H.; Rabon, E.; Shackman, R.; Lewin, M.; Saccomani, G. *J. Biol. Chem.* **1976**, 251, 7690

Goodall, M.C.; Sachs, G. *J. Membrane Biol.* **1977**, 35, 285

### Pulse radiolysis

Chapero, A.; Boag, J.W.; Ebert, M.; Gray, L.H. *J. Chim. Physique et de Physico-Chimie Biologique* **1953**, 50, 468

Gray, L.H.; Conger, A.D.; Ebert, M.; Hornsey, S.; Scott, O.C.A. *Brit. J. Radiol.* **1953**, 26, 638

Mains, G.J.; Newton, A.S.; Sciamanna, A.F. *J. Phys. Chem.* **1961**, 65, 1286

MacLashan, A.; McCarthy, R.L. *J. Am. Chem. Soc.* **1962**, 84, 2519

Dorfman, L.M.; Taub, I.A.; Buehler, R.E. *J. Chem. Phys.* **1962**, 36, 3051

Taub, I.A.; Dorfman, L.M. *J. Am. Chem. Soc.* **1962**, 84, 4053

Dorfman, L.M.; Taub, I.A. *J. Am. Chem. Soc.* **1963**, 85, 2370

Dorfman, L.M. *Science* **1963**, 141, 493

Keene, J.P. *J. Sci. Instrum.* **1964**, 41, 493

### Pump-probe technique

Buettner, A.V.; Snavely, B.B.; Peterson, O.G. in *Molecular Luminescence, Int. Conf.* (E.C. Lim, ed.) W.A. Benjamin, Inc.: New York, 1969, p. 403

Lin, C.; Dienes, A. *Optics Commun.* **1973**, 9, 21

Oseroff, A.R.; Callender, R.H. *Biochemistry* **1974**, 13, 4243

Peterson, L.M.; Lindqvist, G.H.; Arnold, C.B. *J. Chem. Phys.* **1974**, 61, 3480

### "Push-pull" mechanism

Swain, C.G. *J. Am. Chem. Soc.* **1948**, 70, 1119

Swain, C.G.; Eddy, R.W. *J. Am. Chem. Soc.* **1948**, 70, 2989

### **QSAR (quantitative structure-activity relationship)**

Hansch, C.; Steward, A.R. *J. Med. Chem.* **1964**, 7, 691

Hansch, C.; Fujita, T. *J. Am. Chem. Soc.* **1964**, 86, 1616

Hansch, C.; Deutsch, E.W. *J. Med. Chem.* **1965**, 8, 705

Hansch, C.; Steward, A.R.; Iwasa, J.; Deutsch, E.W. *Molec. Pharmacol.* **1965**, 1, 205

Hansch, C.; Deutsch, E.W. *Biochim. Biophys. Acta* **1966**, 112, 381; 126, 117

Brown, A. Crum; Fraser, T.R. *Trans. Roy. Soc. Edinburgh* **1869**, 25, 151

Brown, A. Crum; Fraser, T.R. *Proc. Roy. Soc. Edinburgh* **1869**, 6, 461; 556

Brown, A. Crum; Fraser, T.R. *Proc. Roy. Soc. Edinburgh* **1872**, 7, 663

Brown, A. Crum; Fraser, T.R. *Proc. Roy. Soc. Edinburgh* **1869**, 6, 228

Richet, C. *Compt. Rend. Seances Soc. Biol.* **1893**, 9, 775

Richardson, B.J. *Medical Times and Gazette* **1868**, 2, 703

### **Quantum concept**

Planck, M. *Ann. Physik* **1900**, 1, 69

### **Quantum theory of electron**

Dirac, P.A.M. *Proc. Roy. Soc.* **1927**, 117A, 610

Dirac, P.A.M. *Proc. Roy. Soc.* **1928**, 118A, 351

### **Radioactive tracers**

Paneth, F.A.; Hevesy, G. *S.B. Acad. Wiss. Wien Abt Iia* **1913**, 122, 993

Paneth, F.A.; Hevesy, G. *S.B. Acad. Wiss. Wien Abt Iia* **1913**, 122, 1001

Paneth, F.A.; Hevesy, G. *Mh. Chem.* **1913**, 34, 1393

Paneth, F.A.; Hevesy, G. *Z. Anorg. Chem.* **1913**, 82, 323

Paneth, F.A.; Hevesy, G. *Chem. Ber.* **1914**, 47, 2748

Paneth, F.A.; Hevesy, G. *Sci. Progr.* **1937**, 32, 38

Paneth, F.A. *Quart. Rev. Chem. Soc. London* **1948**, 2, 93

Paneth, F.A. *Inst. Inst. Chim. Solvay, Cons. Chim.* **1948**, 220

Paneth, F.A. *Nature* **1948**, 161, 456

Paneth, F.A. *Nature* **1949**, 163, 388

### **Radiocarbon dating**

Libby, W.F. *Radiocarbon Dating*, University of Chicago: Chicago, 1952

### **Reaction intermediates concept (carbonium ions)**

Norris, J.F. *Am. Chem. J.* **1907**, 38, 627

Stieglitz, J. *Am. Chem. J.* **1899**, 21, 101

## Reactivity-selectivity principle

Giese, B. *Acc. Chem. Res.* **1984**, 17, 438

## Resolution of organic compounds containing asymmetric heteroatoms

### Nitrogen

Pope, W.J.; Peachey, S.J. *J. Chem. Soc.* **1899**, 75, 1127

Pope, W.J.; Peachey, S.J. *Proc. J. Chem. Soc.* **1899**, 192

Pope, W.J.; Read, J. *J. Chem. Soc.* **1912**, 101, 519

### Sulfur

Pope, W.J.; Peachey, S.J. *J. Chem. Soc.* **1900**, 77, 1072

Pope, W.J.; Peachey, S.J. *Proc. J. Chem. Soc.* **1900**, 12

### Tin

Pope, W.J.; Peachey, S.J. *Proc. J. Chem. Soc.* **1900**, 42; 116; 117

### Selenium

Pope, W.J.; Neville, A.H.D. *J. Chem. Soc.* **1902**, 82, 1552

Pope, W.J.; Neville, A.H.D. *Proc. J. Chem. Soc.* **1902**, 198

## Retrosynthetic analysis

Sheehan, J.C.; Buhle, E.L.; Corey, E.J.; Laubach, G.D.; Ryan, J.J.

*J. Am. Chem. Soc.* **1950**, 72, 3828

Corey, E.J.; Ohno, M.; Mitra, R.B.; Vatakencherry, P.A.

*J. Am. Chem. Soc.* **1964**, 86, 478

Corey, E.J.; Mitra, R.B.; Uda, H. *J. Am. Chem. Soc.* **1964**, 86, 485

Corey, E.J.; Cheng, X.M. *The Logic of Chemical Synthesis*, Wiley: New York, 1989

Corey, E.J.; Anderson, N.H.; Carlson, R.M.; Paust, J.; Vedejs, E.; Vlattas, I.;

Winter, R.E.K. *J. Am. Chem. Soc.* **1968**, 90, 3245

Corey, E.J.; Wipke, T.W. *Science* **1969**, 166, 178

Corey, E.J.; Long, A.K.; Rubenstein, S.D. *Science* **1985**, 228, 408

## Rings and unsaturations formula for chemical structures

Lodge, O.J. *Phil. Mag.* **1875**, 50, 367

## Rule of alternating polarities

Lapworth, A. *Mem. Manchester Phil. Soc.* **1920**, 64(3), 1

Lapworth, A. *J. Chem. Soc.* **1922**, 121, 416

Lapworth, A.; Robinson, R. *Trans. Faraday Soc.* **1923**, 19, 503

Burkhardt, G.N.; Lapworth, A. *J. Chem. Soc.* **1925**, 127, 1742

## Scaling laws

Brochard, F.; de Gennes, P.G. *Macromolecules* **1977**, 10, 1157  
de Gennes, P.G. *J. Polym. Sci., Polym. Phys. Ed.* **1978**, 16, 1883  
de Gennes, P.G. *Physica A (Amsterdam)* **1986**, 138A, 206  
Daoud, M.; de Gennes, P.G. *J. Phys. (Paris)* **1977**, 38, 85  
de Gennes, P.G. *Phys. Lett. A* **1968**, 26, 313

## Scanning tunnelling microscopy

Binnig, G.; Rohrer, H. *Eur. Pat. Appl.* **1981** (IBM Corp., USA); EP 27517 (1981/04/29); U.S. 4,343,993 (1982/08/10)  
Sheel, H.J.; Binnig, G.; Rohrer, H. *J. Crystal Growth* **1982**, 60, 199  
Binnig, G.; Rohrer, H. *Phys. Bl.* **1983**, 39, 16  
Binnig, G.; Rohrer, H. *Surf. Sci.* **1983**, 126, 236  
Binnig, G.; Rohrer, H. *Helv. Phys. Acta* **1982**, 55, 726  
Binnig, G.; Rohrer, H. *Ultramicroscopy* **1983**, 11, 157  
Binnig, G.; Rohrer, H. *Scanning Electron Microsc.* **1983**, 1079  
Binnig, G.; Rohrer, H. *Physica B & C* **1984**, 127, 37  
Binnig, G.; Rohrer, H. *Surf. Sci.* **1985**, 152-153, 17  
Baro, A.M.; Miranda, R.; Alaman, J.; Garcia, N.; Carrascosa, J.L. *Nature* **1985**, 315, 253

## Site-directed mutagenesis

Winter, G.; Fersht, A.R.; Wilkinson, A.J.; Zoller, M.; Smith, M. *Nature* **1982**, 299, 756  
Pielak, G.J.; Mauk, A.G.; Smith, M. *Nature* **1985**, 313, 152  
Goodin, D.B.; Mauk, A.G.; Smith, M. *Proc. Natl. Acad. Sci. USA* **1986**, 83, 1295  
Smith, M. *Trends Biochem. Sci. (Pers. Ed.)* **1982**, 7, 440  
Smith, M. *Phil. Trans. Roy. Soc. London A* **1986**, 317, 295

## Sixteen and eighteen electron rule (organometallic complexes)

Langmuir, I. *Science* **1921**, 54, 59  
Sidgwick, N.V. *The Electronic Theory of Valency*, Clarendon Press: Oxford, 1927. Chapter 10 (effective atomic number rule)  
Sidgwick, N.V.; Bailey, R.W. *Proc. Roy. Soc. London* **1934**, 144A, 521  
Blanchard, A.A. *Chem. Rev.* **1940**, 26, 409  
Tolman, C.A. *Chem. Soc. Rev.* **1972**, 1, 337

## SN1 and SN2 mechanisms

Gleave, J.L.; Hughes, E.D.; Ingold, C.K. *J. Chem. Soc.* **1935**, 236  
Hughes, E.D. *J. Am. Chem. Soc.* **1935**, 57, 708  
Ingold, C.K. *Chem. Rev.* **1934**, 15, 225

## SNR1 mechanism

Kim, J.K.; Bunnett, J.F. *J. Am. Chem. Soc.* **1970**, 92, 7463

Kim, J.K.; Bunnett, J.F. *J. Am. Chem. Soc.* **1970**, 92, 7464

### Solvent effects in kinetics

Laidler, K.J.; Eyring, H. *Ann. N.Y. Acad. Sci.* **1940**, 39, 303

Barnard, M.L.; Laidler, K.J. *J. Am. Chem. Soc.* **1952**, 74, 6099

Laidler, K.J. *Disc. Faraday Soc.* **1956**, 22, 88

Laidler, K.J. *J. Chim. Phys. Physico-Chim. Biol.* **1957**, 54, 485

### Solvolysis

Steigman, J.; Hammett, L.P. *J. Am. Chem. Soc.* **1937**, 59, 2536

Farinacci, N.T.; Hammett, L.P. *J. Am. Chem. Soc.* **1937**, 59, 2542

Farinacci, N.T.; Hammett, L.P. *J. Am. Chem. Soc.* **1938**, 60, 3097

Ward, A.M. *J. Chem. Soc.* **1927**, 2235

### Special salt effect

Winstein, S.; Clippinger, E.; Fainberg, A.H.; Robinson, G.C.

*J. Am. Chem. Soc.* **1954**, 76, 2597

Fainberg, A.H.; Winstein, S. *J. Am. Chem. Soc.* **1956**, 78, 2763

Winstein, S.; Klinedinst, Jr., P.E.; Clippinger, E.

*J. Am. Chem. Soc.* **1961**, 83, 4986

### Spectra of gases

Plücker, J. *Ann. Physik* **1858**, 103, 88; 151

Plücker, J. *Ann. Physik* **1858**, 104, 113

Plücker, J. *Ann. Physik* **1858**, 105, 67

Plücker, J. *Ann. Physik* **1859**, 106, 77

Plücker, J. *Ann. Chim. Phys.* **1858**, 54, 243

Plücker, J. *Phil. Mag.* **1858**, 16, 119; 408

Plücker, J. *Phil. Mag.* **1858**, 18, 1; 7

Plücker, J. *Ann. Physik* **1859**, 107, 497; 638

Plücker, J. *Ann. Chim. Phys.* **1859**, 57, 497

Plücker, J. *Proc. Roy. Soc. London* **1859 - 1860**, 10, 256

Plücker, J. *Nuovo Cimento* **1860**, 11, 66

Plücker, J. *Ann. Physik* **1862**, 116, 27

Hittorf, W. *Ann. Physik* **1869**, 136, 1; 197

Hittorf, W. *Ann. Chim. Phys.* **1869**, 17, 487

### Spin concept

Uhlenbeck, G.; Goutsmit, S.A. *Naturwiss.* **1925**, 13, 953

Uhlenbeck, G.; Goutsmit, S.A. *Nature* **1926**, 117, 264

### Stereochemical basis of drug action

Cushny, A.R. *Biological Relation of Optically Isomeric Substances*, Balliere, Tindall, & Cox: London, 1926

## Stereochemistry (tetrahedral carbon)

Butlerov, A.M. *Uchenye zapiski Kazanskogo universiteta* (Notes of Kazan University), 1862, vip. 1, otd. 1, p. 13

Butlerov, A.M. *Z. Chem.* **1861**, 4, 556

Butlerov, A.M. *Z. Chem.* **1862**, 5, 299

Butlerov, A.M. *Sochineniia*, (Works), USSR Academy of Sciences, Moscow, 1953, Vol. 1., p.76

Van't Hoff, J.H., *The Arrangement of Atoms in Space*, Longmans: New York, 1898.

Van't Hoff, J.H. *La Chimie dans l'Espace*, Rotterdam: 1875

Pasteur, L., *Ann. Chim. Phys.* **1848**, 24, 442

Pasteur, L., *Ann. Chim. Phys.* **1848**, 26, 535

Pasteur, L. *Compt. Rend.* **1849**, 28, 477

Pasteur, L. *Compt. Rend.* **1849**, 29, 297

Pasteur, L., *Ann. Chim. Phys.* **1850**, 28, 56

Pasteur, L., *Ann. Chim. Phys.* **1853**, 38, 437

Pasteur, L. *Compt. Rend.* **1858**, 46, 615 (suggestion that chiral compounds could be distinguished by olfactory nerves)

Pasteur, L. *Recherches sur la Dissymetrie Moleculaire des Produits Organiques Naturels*, in *Lecons de Chimie Professees*, Librairie Hachette: Paris, 1860. pp. 1-48.

Pasteur, L. *Compt. Rend.* **1874**, 78, 1515 (idea that our world is chiral)

Le Bel, J.A., *Bull. Soc. Chim. Fr.* **1874**, 22[2], 337

Le Bel, J.A. *Chemical News* **1875**, 31, 9

Van't Hoff, J.H., *Arch. Neerl. Sci.* **1874**, 9, 445

Larder, D.F. *J. Chem. Educ.* **1967**, 44, 661

## Stereoisomerism

Meyer, V. *Chem. Ber.* **1890**, 23, 567

Auwers, K.; Meyer, V. *Chem. Ber.* **1891**, 23, 2082

Eiloart, A. *Am. Chem. J.* **1891**, 12, 231

Eiloart, A. *J. Prakt. Chem.* **1891**, 43, 124

## Steric effect

Meyer, V. *Chem. Ber.* **1894**, 27, 510

## Stopped-flow technique

Chance, B. *J. Franklin Inst.* **1940**, 229, 455

Chance, B. *J. Franklin Inst.* **1940**, 229, 613

Chance, B. *J. Franklin Inst.* **1940**, 229, 737

Gibson, Q.H.; Milmes, L. *Biochem. J.* **1964**, 91, 161

## Strain

## ring systems

Baeyer, A. *Chem. Ber.* **1885**, 18, 2269

## B-strain (bond)

Brown, H.C. *J. Am. Chem. Soc.* **1945**, 67, 503

Brown, H.C.; Bartholomay, H.; Taylor, M.D. *J. Am. Chem. Soc.* **1944**, 66, 435

## F-strain (force)

Brown, H.C. *J. Am. Chem. Soc.* **1945**, 67, 374

Brown, H.C. *J. Am. Chem. Soc.* **1945**, 67, 378

Brown, H.C. *J. Am. Chem. Soc.* **1945**, 67, 1452

Brown, H.C. *J. Am. Chem. Soc.* **1945**, 67, 1765

## I-strain (internal)

Brown, H.C.; Fletcher, R.S.; Johannesen, R.B. *J. Am. Chem. Soc.* **1951**, 73, 212

Brown, H.C.; Gerstein, M. *J. Am. Chem. Soc.* **1950**, 72, 2926

## Structure of benzene

Loschmidt, J. *Chemische Studien*, Carl Gerold's Sohn: Vienna, **1861**

Anschütz, R. (ed.) *Konstitutions-Formeln der organischen Chemie in graphischer Darstellung* by J. Loschmidt, *Ostwalds Klassiker der Exakten Wissenschaften* No. 190, Wilhelm Engelmann: Leipzig, **1913**

Kekulé, A. *Bull. Soc. Chim. Fr.* **1865**, 3[2], 98

## Structure of carbon containing molecules (tetravalency of carbon)

Kekulé, A. *Ann. Chem.* **1857**, 104, 133

Kekulé, A. *Ann. Chem.* **1857**, 101, 200

Kolbe, H.; Frankland, E. *Ann. Chem.* **1857**, 101, 256

Odling, W. *Proc. Roy. Soc. London* **1858**, 2, 63

Couper, A.S. *Compt. Rend.* **1858**, 46, 1157

Couper, A.S. *Phil. Mag.* **1858**, 16[4], 104

Couper, A.S. *Ann. Chim. Phys.* **1858**, 53[3], 469

Kekulé, A. *Ann. Chem. Pharm.* **1858**, 106, 129

Brown, A. *Crum Proc. Roy. Soc. Edinburgh* **1866**, 5, 429

## Substituent effect

Hammett, L.P., *J. Am. Chem. Soc.* **1937**, 59, 96

Hammett, L.P., *Chem. Rev.* **1935**, 17, 125

## Superconductivity at low temperatures

Onnes, H.K. *Electrician* **1911**, 67, 657

Onnes, H.K. *Electrician* **1913**, 71, 855

Onnes, H.K. *Verlag. Akad. Wetenschappen* **1913**, 20, 1284; 1388

Onnes, H.K. *Proc. K. Akad. Wetenschappen* **1914**, 16, 673; 987

Onnes, H.K. *J. Chem. Soc.* **1914**, 106, 163

Onnes, H.K. *Proc. K. Akad. Wetenschappen* **1914**, 22, 1027

Onnes, H.K. *Verlag. Akad. Wetenschappen* **1914**, 22, 1413

Onnes, H.K. *Verlag. Akad. Wetenschappen* **1914**, 23, 167

Onnes, H.K. *Compt. Rend.* **1914**, 159, 34

Onnes, H.K.; Beckman, B. *Verlag. Akad. Wetenschappen* **1914**, 21, 263; 478; 881; 888

Onnes, H.K.; Hof, K. *Verlag. Akad. Wetenschappen* **1914**, 23, 493

Onnes, H.K.; Holst, G. *Verlag. Akad. Wetenschappen* **1914**, 23, 506

### **Synthesis of a dinucleotide monophosphate**

Michelson, A.M.; Todd, A.R. *J. Chem. Soc.* **1955**, 2632

### **Synthesis of adenosine diphosphate**

Baddiley, J.; Todd, A.R. *J. Chem. Soc.* **1947**, 648

### **Synthesis of adenosine triphosphate**

Michelson, A.M.; Todd, A.R. *J. Chem. Soc.* **1949**, 2487

### **Synthesis of a gene**

Khorana, H.G. *Science* **1979**, 203, 614

### **Synthesis of glutathione**

Harington, C.R.; Mead, T.H. *Biochem. J.* **1935**, 29, 1602

### **Synthesis of new radioactive elements using slow neutrons**

Fermi, E. *Nature* **1934**, 133, 757; 898

Fermi, E.; Pontecorvo, B.; Rasetti, F. *Ricerca Sci.* **1934**, 5(II), 380

Amaldi, E.; Fermi, E. *Ricerca Sci.* **1935**, 6, 344; 443

Fermi, E.; Amaldi, E. *Phys. Rev.* **1936**, 50, 899

Amaldi, E.; Fermi, E. *Ricerca Sci.* **1936**, 7(I), 310; 393

Amaldi, E.; Fermi, E.; Rasetti, F. *Ricerca Sci.* **1937**, 8(II), 40

Fermi, E.; Amaldi, E.; Wick, G.C. *Phys. Rev.* **1938**, 53, 493

Fermi, E.; Amaldi, E. *Phys. Rev.* **1938**, 53, 493

Anderson, H.L.; Fermi, E.; Hanstein, H.B. *Phys. Rev.* **1939**, 55, 797

Anderson, H.L.; Fermi, E.; Szilard, L. *Phys. Rev.* **1939**, 56, 284

Fermi, E. *Science* **1940**, 92, 269

Fermi, E. *Nature* **1940**, 146, 640

### **Synthesis of physostigmine**

Julian, P.L. *J. Am. Chem. Soc.* **1934**, 56, 1797

Julian, P.L.; Piki, J. *J. Am. Chem. Soc.* **1935**, 57, 539; 755

## Synthesis of radioactive elements

Joliot, F.; Joliot-Curie, I. *Compt. Rend. Acad. Sci.* **1934**, 198, 254

Joliot-Curie, I.; vonHalban, H.; Prieswerk, P.

*J. Phys. Radium(France)* **1925**, 6

## Synthesis of thyroxine

Harington, C.R. *Biochem. J.* **1926**, 20, 293; 300

Harington, C.R.; Barger, G. *Biochem. J.* **1927**, 21, 169

Harington, C.R. *Biochem. J.* **1928**, 22, 1429

Harington, C.R.; Randall, S.S. *Biochem. J.* **1929**, 23, 373

Harington, C.R.; Salter, W.J. *Biochem. J.* **1930**, 24, 456

## Tautomerism

Laar, C. *Ber.* **1885**, 18, 648

Laar, C. *Ber.* **1886**, 19, 730

Butlerov, A. *Ann. Chem.* **1877**, 189, 44

Baeyer, A.; Oekonomides, S. *Ber.* **1882**, 15, 2093

Baeyer, A. *Ber.* **1883**, 16, 2188

Michael, A. *J. Prakt. Chem.* **1888**, 37, 487

Wisliscenus, W. *Ann. Chem.* **1896**, 291, 147

Wisliscenus, W. *Ann. Chem.* **1900**, 312, 34

Wisliscenus, W. *Ber.* **1899**, 32, 2837

Nef, J.U. *Am. Chem. J.* **1907**, 37, 296

Knorr, L.; Rothe, O.; Averbeck, H. *Ber.* **1911**, 44, 1138

Meyer, K.H. *Ann. Chem.* **1911**, 380, 212

Meyer, K.H.; Koppelmeier, P. *Ber.* **1911**, 44, 2718

Meyer, K.H. *Ber.* **1912**, 45, 2843

Meyer, K.H. *Ber.* **1914**, 47, 826

## Temperature jump (T-jump) technique

Czerlinski, G.H.; Eigen, M. *Z. Elektrochem. Angew. Physik. Chem.* **1959**, 63, 652

Eigen, M.; De Maeyer, L.; Heidberg, J.; Kohlmaier, G.H. *Chem. Elementarprozesse*, **1968**, 417

Eigen, M.; De Maeyer, L. *1st Proc. Int. Colloq. Rapid Mixing Sampling Tech. Appl. Study Biochem. Reactions*, Philadelphia, 1964, p. 175

## Theory of peptide protein synthesis

Fischer, E.; Fournneau, E. *Chem. Ber.* **1901**, 34, 2868

Hofmeister, F. *Naturwiss. Rundschau* **1902**, 17, 529; 545

Fischer, E. *Chem. Z.* **1902**, 26, 939

## Thin-layer chromatography

Meinhard, J.E.; Hall, N.F. *Anal. Chem.* **1949**, 21, 185

Kirchner, J.K.; Miller, J.M.; Keller, C.J. *Anal. Chem.* **1951**, 23, 420

### Three-phase test for reaction intermediates

Rebek, J.; Gavina F. *J. Am. Chem. Soc.* **1974**, 96, 7112

Rebek, J.; Brown, D.; Zimmerman, S. *J. Am. Chem. Soc.* **1975**, 97, 454

Rebek, J.; Gavina F. *J. Am. Chem. Soc.* **1975**, 97, 1591

Rebek, J.; Gavina F. *J. Am. Chem. Soc.* **1975**, 97, 3221

Rebek, J.; Gavina F. *J. Am. Chem. Soc.* **1975**, 97, 3453

### Three-point model (molecular chiral recognition mechanism)

Easson, E.H.; Stedman, E. *Biochem. J.* **1933**, 27, 1257

Ogston, A.G. *Nature* **1948**, 29, 963

### Time resolved spectroscopy and kinetics

Norrish, R.W.G.; Porter, G. *Nature* **1949**, 164, 658

Norrish, R.W.G.; Porter, G. *Proc. Roy. Soc.* **1952**, A210, 439

Norrish, R.W.G.; Porter, G.; Thrush, B.A. *Nature* **1952**, 169, 582

Norrish, R.W.G.; Porter, G.; Thrush, B.A. *Proc. Roy. Soc.* **1953**, A216, 165

Norrish, R.W.G.; Porter, G.; Thrush, B.A. *Proc. Roy. Soc.* **1955**, A227, 423

Erhard, K.H.L.; Norrish, R.W.G.; Porter, G. *Proc. Roy. Soc.* **1956**, A234, 178

Erhard, K.H.L.; Norrish, R.W.G.; Porter, G. *Proc. Roy. Soc.* **1960**, A259, 297

Norrish, R.G.W. *Chem. Br.* **1965**, 1, 289

Norrish, R.G.W. *Am. Scientist* **1962**, 50, 131

Norrish, R.G.W. *Experientia Suppl. VII* **1957**, 7, 87

Norrish, R.G.W. *Quart. Rev.* **1956**, 10, 149

Porter, G. *Proc. Roy. Soc.* **1950**, A200, 284

Porter, G. *Disc. Faraday Soc.* **1950**, 9, 60

Porter, G.; Wright, F.J. *Disc. Faraday Soc.* **1953**, 14, 23

Porter, G.; Windsor, M.W. *J. Chem. Phys.* **1953**, 21, 2088

Porter, G.; Windsor, M.W. *Disc. Faraday Soc.* **1954**, 17, 178

Porter, G.; Windsor, M.W. *Proc. Roy. Soc.* **1958**, A245, 238

Porter, G.; Wright, M.R. *J. Chim. Phys.* **1958**, 55, 705

Porter, G.; Wright, M.R. *Disc. Faraday Soc.* **1959**, 27, 18

Porter, G.; West, P. *Proc. Roy. Soc.* **1964**, A279, 302

Porter, G.; Wilkinson, F. *Proc. Roy. Soc.* **1961**, A264, 1

Godfrey, T.S.; Porter, G.; Suppan, P. *Disc. Faraday Soc.* **1965**, 39, 194

Porter, G.; Steinfield, J.I. *J. Chem. Phys.* **1966**, 45, 3456

Porter, G.; Topp, M.R. *Nature* **1968**, 220, 1228

Porter, G.; Topp, M.R. *Proc. Roy. Soc.* **1970**, A315, 163

Porter, G. in *Techniques of Organic Chemistry*; Weissberger, A., Ed.;

Interscience: London, 1963; Vol. 8, Part 2

Patterson, L.; Porter, G. *Chem. Br.* **1970**, 6, 246

Porter, G. in *Photochemistry and Reaction Kinetics*; Ashmore, P.G.; Dainton, F.S.;

Sugden, T.M., Eds.; Cambridge University Press: Cambridge, 1967; pp 93 – 111

Eigen, M.; Diebler, H.; Czerlinski, B.

*Z. Physik. Chem. (Frankfurt)* **1959**, 19, 246

Eigen, M.; Hammes, G.G. *J. Am. Chem. Soc.* **1960**, 82, 5951

Eigen, M.; Kurtze, G.; Tamm, K. *Z. Elektrochem.* **1953**, 57, 103

Eigen, M.; Tamm, K. *Z. Elektrochem.* **1962**, 66, 93; 107

### Transition state theory

Eyring, H. *J. Chem. Phys.* **1935**, 3, 107

Polanyi, M. *Trans. Faraday Soc.* **1935**, 31, 875

Wigner, E.; Farkas, L. *Trans. Faraday Soc.* **1936**, 32, 708

Pelzer, H.; Wigner, E. *Z. Physik. Chem. B* **1932**, 15, 445

Altar, W.; Eyring, H. *J. Chem. Phys.* **1936**, 4, 661

Gershinowitz, H.; Eyring, H. *J. Am. Chem. Soc.* **1935**, 57, 985

### Two laser-two colour experiment

Newton, K.R.; Lichtin, D.A.; Bernstein, R.B. *J. Phys. Chem.* **1981**, 85, 15

Dietz, T.G.; Duncan, M.A.; Smalley, R.E. *J. Chem. Phys.* **1982**, 76, 1227

Morikawa, E.; Isono, Y.; Kotani, M. *J. Chem. Phys.* **1983**, 78, 2691

Kelley, D.F.; Milton, S.V.; Huppert, D.; Rentzepis, P.M. *J. Phys. Chem.* **1983**, 87, 1842

Bromberg, A.; Schmidt, K.H.; Meisel, D. *J. Am. Chem. Soc.* **1984**, 106, 3056

Bromberg, A.; Schmidt, K.H.; Meisel, D. *J. Am. Chem. Soc.* **1985**, 107, 83

Nagarajan, V.; Fessenden, R.W. *Chem. Phys. Lett.* **1984**, 112, 207

Hilinski, E.F.; Huppert, D.; Kelley, D.F.; Milton, S.V.; Rentzepis, P.M. *J. Am. Chem. Soc.* **1984**, 106, 1951

Griller, D.; Nazran, A.S.; Scaiano, J.C. *Acc. Chem. Res.* **1984**, 17, 283

Scaiano, J.C.; Tanner, M.; Weir, D. *J. Am. Chem. Soc.* **1985**, 107, 4396

Scaiano, J.C.; McGimpsey, W.G.; Casal, H.L. *J. Am. Chem. Soc.* **1985**, 107, 7204

Scaiano, J.C.; Johnston, L.J. *Pure Appl. Chem.* **1986**, 58, 1273

McGimpsey, W.G.; Scaiano, J.C. *J. Am. Chem. Soc.* **1987**, 109, 2179

McGimpsey, W.G.; Scaiano, J.C. *Chem. Phys. Lett.* **1987**, 138, 13

Scaiano, J.C.; Johnston, L.J.; McGimpsey, W.G.; Weir, D. *Acc. Chem. Res.* **1988**, 21, 22

Scaiano, J.C.; Wintgens, V.; Netto-Ferreira, J.C.; *Pure Appl. Chem.* **1990**, 62, 1557

### Ultraviolet spectroscopy

Hartley, W.N.; Huntington, A.K. *Proc. Roy. Soc.* **1879**, 28, 233

### Use of enzymes to catalyze simple organic reactions

Loevenhart, A.S.; Kastle, J.H. *Am. Chem. J.* **1903**, 29, 397

Acree, S.F. *Am. Chem. J.* **1908**, 39, 306

Acree, S.F. *Am. Chem. J.* **1909**, 41, 462

Cornforth, J.W. *Science* **1976**, 193, 121

Cornforth, J.W. *Chem. Br.* **1970**, 9, 431

### **Valence shell electron pair repulsion theory (VSEPR)**

Bent, H.A., *Chem. Rev.* **1961**, 61, 275

Gillespie, R.J., *J. Chem. Educ.* **1963**, 40, 295

Burdett, J.K., *Chem. Soc. Rev.* **1978**, 7, 507

Hall, M.B., *J. Am. Chem. Soc.* **1978**, 100, 6333

Gillespie, R.J.; Hargittai, I., *The VSEPR Model of Molecular Geometry*, Allyn & Bacon: Boston, 1991

Gillespie, R.J., *Chem. Soc. Rev.* **1992**, 21, 59

### **Variable Marcus intrinsic barriers for deprotonation of carbon acids**

Bunting, J.W.; Stefanidis, D. *Can. J. Chem.* **1988**, 110, 4008

Bunting, J.W.; Stefanidis, D. *J. Am. Chem. Soc.* **1989**, 111, 5834

### **Verification of absolute configuration of tartaric acid (verification of Fischer assignments)**

Bijvoet, B.M.; Peerdeman, A.F.; Bommel, A.J. van *Nature* **1951**, 168, 271

### **Wave nature of electron**

Davisson, C.J.; Germer, L.H. *Nature* **1927**, 119, 558

### **Whole number rule for isotopes**

Aston, F.W. *Mass Spectra and Isotopes*, Edward Arnold: London, 1933

Aston, F.W. *Nature* **1929**, 123, 313

### **X-ray diffraction**

Friedrich, W.; Knipping, P.; Laue, M. *Sitzungsber. Bayer. Akad. Wiss. (Math. Phys. Klasse)* **1912**, 303

Friedrich, W.; Knipping, P.; Laue, M. *Ann. Physik* **1913**, 41, 971

Bragg, W.H.; Bragg, W.L. *X-Rays and Crystal Structure*, London, 1915

### **X-ray structures of organic compounds**

Hexamethylenetetramine

Gonnel, H.; Mark, H. *Z. Physik. Chem.* **1923**, 107, 181

Graphite

Hassel, O.; Mark, H. *Z. Physik* **1924**, 25, 317

Oxalic acid

Hoffmann, H.; Mark, H. *Z. Physik. Chem.* **1924**, 111, 321

### Calomel

Mark, H.; Steinbach, J. Z. *Kristall*. **1926**, 64, 79

### Solid carbon dioxide

Mark, H.; Pohland, E. Z. *Kristall*. **1925**, 61, 293

Mark, H.; Pohland, E. Z. *Kristall*. **1926**, 64, 113

### Ethane versus borane

Pohland, E.; Mark, H. Z. *Kristall*. **1925**, 62, 103

### Organic compounds

Mark, H. *Chem. Ber.* **1924**, 57B, 1820

### High molecular organic substances

Mark, H. *Chem. Ber.* **1926**, 59, 2982

Mark, H. *Scientia* **1932**, 51, 405

Mark, H.; Meyer, K.H. *Hochpolymerer Chemie*, Leipzig, 1937

### Cellulose

Meyer, K.H.; Mark, H. *Chem. Ber.* **1928**, 61, 593

Mark, H. *Physik und Chemie der Zellulose*, 1932

### Hevea rubber

Susich, G. von; Mark, H. *KolloidZ.* **1928**, 46, 11