

NAMED THINGS IN CHEMICAL INDUSTRY

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Sir Frederick Augustus Abel

17 July 1827 - 6 September 1902

British, b. London, England

Cordite (guncotton and dynamite)

Abel, F.A. *Roy. Inst. Gr. Brit. Proceedings* **1854 - 1858**, 2, 283

Abel, F.A. *Roy. Inst. Gr. Brit. Proceedings* **1862- 1866**, 4, 245

Abel, F.A. *Proc. Roy. Soc. London* **1864**, 13, 204

Abel, F.A. *Phil. Trans.* **1866**, 156, 269

Abel, F.A. *Phil. Trans.* **1867**, 157, 181

Abel, F.A. *Phil. Trans.* **1869**, 159, 489

Abel, F.A. *Phil. Trans.* **1874**, 164, 337

Noble, Capt.; Abel, F.A. *Proc. Roy. Soc. London* **1874**, 22, 160; 408

Noble, Capt.; Abel, F.A. *Phil. Trans.* **1875**, 165, 49

Abel, F.A. *Compt. Rend.* **1876**, 83, 1011

Abel, F.A. *Roy. Inst. Gr. Brit. Proceedings* **1879**, 9, 62

Noble, Capt.; Abel, F.A. *Proc. Roy. Soc. London* **1879 - 1880**, 30, 198

Noble, Capt.; Abel, F.A. *Compt. Rend.* **1879**, 89, 155

Biographical references:

Pogg. 3, 4; 4, 3

Magnusson, Magnus (ed.), *Cambridge Biographical Dictionary*, Cambridge University Press: Cambridge, UK, 1990.

Henry Edward Armstrong

6 May 1848 - 13 July 1937

British, b. Lewisham, England

Discovery of 1,3-butadiene in cracked petroleum

Armstrong, H.E.; Miller, A.K. *Trans. Chem. Soc.* **1886**, 49, 74

Biographical references:

Pogg. 4, 37; 5, 33; 6(1), 76

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Ronneberg, C.E. in Gillispie, Charles Coulston (ed.), *Dictionary of Scientific Biography*, Charles Scribner & Sons: New York, 1981, Vol. 1, 288

Rodd, E.H. *J. Chem. Soc.* **1940**, 1418

Armstrong, E.F. *Chem. Ind.* **1941**, 80

Keeble, K.W. *Obit. Not. Fellows Roy. Soc.* **1941**, 3, 229

Hartley, H. *Chem. Ind.* **1945**, 398; 406

Leo Hendrik Baekeland

14 November 1863 - 23 February 1944

Belgian-American, b. Ghent, Belgium

Bakelite

Baekeland, L. *Ind. Eng. Chem.* **1909**, 1, 149

Baekeland, L. *Z. Angew. Chem.* **1909**, 22, 2006

Baekeland, L. *Trans. Am. Electrochem. Soc.* **1909**, 15, 393

Baekeland, L. *J. Franklin Inst.* **1910**, 169, 55

Baekeland, L. *Ind. Eng. Chem.* **1910**, 2, 478

Baekeland, L. *Ind. Eng. Chem.* **1911**, 3, 518

Biographical references:

Kettering, C.F., *Biog. Memoirs Natl. Acad. Sci.* **1947**, 24, 281

Farber, E. in Gillispie, Charles Coulston (ed.), *Dictionary of Scientific Biography*, Charles Scribner & Sons: New York, 1981, Vol. 1, 385

Porter, R. (ed.), *The Biographical Dictionary of Scientists*, 2nd ed., Oxford University Press: New York, 1994

Abbott, David (ed.), *The Biographical Dictionary of Scientists: Chemists*, Peter Bedrick Books: New York, 1983

Daintith, J.; Mitchell, S.; Tootill, E.; Gjersten, D., *Biographical Encyclopedia of Scientists*, Institute of Physics Publishing: Bristol, UK, 1994

Farber, Eduard (ed.), *Great Chemists*, Interscience Publishers: New York, 1961

Johann Friedrich Wilhelm Adolf von Baeyer



31 October 1835 - 20 August 1917

German, b. Berlin, Germany

Nobel Prize Chemistry 1905

Synthesis of barbiturates

Baeyer, A. *Ann. Chem.* **1863**, 127, 199

Baeyer, A. *Ann. Chem.* **1864**, 130, 129

Baeyer, A. *Chem. Ber.* **1875**, 8, 612

Synthesis of phthalein dyes

Baeyer, A. *Chem. Ber.* **1876**, 9, 1230

Baeyer, A. *Ann. Chem.* **1876**, 183, 1

Baeyer, A.; Burkhardt, J.B. *Chem. Ber.* **1878**, 11, 1297; 1299

Baeyer, A.; Schraube, C. *Chem. Ber.* **1878**, 11, 1301

Baeyer, A.; Burkhardt, J.B. *Ann. Chem.* **1880**, 202, 111; 126

Baeyer, A. *Ann. Chem.* **1880**, 202, 50; 66; 68; 90; 135; 153

Baeyer, A. *Ann. Chem.* **1882**, 212, 340; 347

Baeyer, A.; Kochendoerfer, E. *Chem. Ber.* **1889**, 22, 2196

Synthesis of triphenylmethane dyes

Baeyer, A.; Villiger, V. *Chem. Ber.* **1903**, 36, 2774

Baeyer, A. *Chem. Ber.* **1904**, 37, 597

Baeyer, A.; Villiger, V. *Chem. Ber.* **1904**, 37, 1183; 2848; 3191

Baeyer, A. *Chem. Ber.* **1905**, 38, 569; 1156

Baeyer, A. *Chem. Ber.* **1907**, 40, 3083

Baeyer, A. *Ann. Chem.* **1907**, 354, 152

Baeyer, A. *Chem. Ber.* **1909**, 42, 2624

Baeyer, A. *Ann. Chem.* **1910**, 372, 80

Synthesis of indigo

Baeyer, A. *Chem. Ber.* **1878**, 11, 1296

Baeyer, A. *Chem. Ber.* **1879**, 12, 456

Biographical References:

James, Laylin K. (ed.), Nobel Laureates in Chemistry 1901 - 1992, American Chemical Society: Washington, DC, 1993

Graebe, C., *Angew. Chem.* **1915**, 28, 433

Willstatter, R., *Angew. Chem.* **1917**, 30, 229

Huisgen, R., *Angew. Chem.* **1986**, 98, 297

Richter, F., *Chem. Ber.* **1935**, 68(IA), 175

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Balsohn

Alkylation of hydrocarbons with aluminum trichloride and olefins

Balsohn *Chem. Ber.* **1879**, 12, 2093

Biographical References:

Alexander I. Basaroff (Basarow)

7 September 1845 - ?

German, b. Wiesbaden, Germany

Industrial process to manufacture urea

Basaroff, A. *J. Prakt. Chem.* **1870**, 2, 283

Biographical references:

Pogg. 3, 76

Alexander Bauer

16 February 1836 - 13 April 1921

Hungarian, b. Altenburg, Hungary

Production of nitric acid by ammonia oxidation (1907)

Biographical references:

Pogg. 4, 75; 5, 73; 6(1), 141

Diergart, P. *Z. Angew. Chem.* **1921**, 34, 401

Pribram, R. *Chem. Ztg.* **1921**, 45, 585

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Eugen Baumann

12 December 1846 - 3 November 1896

German, b. Cannstadt, Germany

Discovery of sulphonic hypnotics

Baumann, E.; Kast, A. *Z. Physiol. Chem.* **1890**, 14, 52

Biographical References:

Debus, Allen G. (ed.) *World Who's Who in Science*, 1st ed., Marquis-Who's Who, Inc.: Hannibal: Missouri, 1968

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Georg Wilhelm Otto Bayer

4 November 1902 - 1 August 1982

German, b. Frankfurt, Germany

Synthesis of diisocyanates to manufacture polyurethanes

(I.G.Farben, 1930s)

Bayer, O. *Angew. Chem.* **1947**, 59, 257

Biographical References:

Pogg. 7A (1), 110

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Clayton Beadle

British, b. ?

see Charles Frederick Cross

Biographical References:

Pierre Jacques Antoine Béchamp

16 October 1816 - 15 April 1908

French, b. Bassing, Dieuze, France

Béchamp process to make aniline

Béchamp, A. *Compt. Rend.* **1858**, 47, 924

Béchamp, A. *Ann. Chim. Phys.* **1854**, 42, 186

Biographical references:

Pogg. 3, 88; 4, 82

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Anon. *Nature* **1908**, 78, 13

Villemin, M. *Bull. Acad. Sci. Nancy* **1972**, 11, 276

Nonclerq, M. *Rev. Hist. Pharm.* **1978**, 25, 257

Claude Louis Berthollet

9 December 1748 - 6 November 1822

French, b. Talloires, Annecy, France

Production of chlorine for bleaching textiles

Berthollet, C.L. *Ann. Chim.* **1789**, 2, 151

Biographical References:

Kapoor, S.C. in Gillispie, Charles Coulston (ed.), *Dictionary of Scientific Biography*, Charles Scribner & Sons: New York, 1981, Vol. 2, 73

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Lemay, P.; Oesper, R.E. *J. Chem. Educ.* **1946**, 23, 156; 230

Kapoor, S.C. *Chymia* **1965**, 10, 53

Patterson, T.S. *Chem. Ind.* **1944**, 99

Edward John Bevan

11 December 1856 - 17 October 1921

British, b. Birkenhead, England

see Charles Frederick Cross

Biographical References:

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Cross, C.F. *J. Chem. Soc.* **1921**, 119, 2121

Kristian Birkeland

13 December 1867 - 15 June 1917

Norwegian, b. Christiania (now Oslo) Norway

Production of nitric acid from nitrogen

Birkeland, K. *Faraday Soc. Trans.* **1906**, 2, 98

Biographical references:

Pogg. 4, 125; 5, 117; 6(1), 230

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Jacques Edwin Brandenberger

19 October 1872 - 13 July 1954

Swiss, b. Zurich, Switzerland

Development of cellophane (1908)

Biographical references:

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Anon. *Chem. Ztg.* **1954**, 78, 541

Oscar Heinrich Ulrich Brunler

German, b. ?

Oxidation of nitrogen gas to nitric acid

Brunler, O.H.U. DE 182,297 (1902/10/03)

Brunler, O.H.U. GB 65,901 (1906/03/10)

Brunler, O.H.U. US 834,257 (1906/10/30)

Brunler, O.H.U. GB 65,852 (1906/03/10)

Brunler, O.H.U.; Kettler FR 363,617 (1906/02/24)

Biographical references:

Louis Paul Cailletet

21 September 1832 - 5 January 1913

French, b. Chatillon sur Côte d'Or, France

Liquefaction of gases (oxygen, hydrogen, nitrogen, air)

Cailletet, L. *Compt. Rend.* **1877**, 85, 851; 1016; 1213

Cailletet, L. *Compt. Rend.* **1878**, 86, 97

Cailletet, L. *Ann. Chim. Phys.* **1878**, 15, 132

Cailletet, L. *Compt. Rend.* **1879**, 88, 61

Cailletet, L. *Compt. Rend.* **1880**, 90, 210

Cailletet, L. *Compt. Rend.* **1881**, 92, 901; 1086

Cailletet, L. *Compt. Rend.* **1882**, 94, 623; 1224

Cailletet, L. *Ann. Chim. Phys.* **1883**, 29, 153

Biographical references:

Pogg. 3, 225; 4, 212; 5, 195

Wallace Hume Carothers

27 April 1896 - 4 April 1937

American, b. Burlington, Iowa, USA

Polyesters

Carothers, W.H.; Arvin, J.A. *J. Am. Chem. Soc.* **1929**, 51, 2560

Carothers, W.H. (E.I. du Pont) US 2,071,250 (1937/02/16)

Carothers, W.H. *Chem. Rev.* **1931**, 8, 353

Carothers, W.H.; Hill, J.W. *J. Am. Chem. Soc.* **1932**, 54, 1559

Polyamides (nylon)

Carothers, W.H. (E.I. du Pont) US 2,130,947 (1938/09/20)

Carothers, W.H. (E.I. du Pont) US 2,130,523 (1938/09/20)

Carothers, W.H. (E.I. du Pont) US 2,130,948 (1938/09/20)

Neoprene rubbers

Carothers, W.H.; Collins, A.M.; Kirby, J.E. (E.I. du Pont) US 1,967,860 (1934/07/24)

Carothers, W.H. *Ind. Eng. Chem.* **1934**, 26, 30

Carothers, W.H.; Collins, A.M.; Kirby, J.E. (E.I. du Pont) GB 468,693 (1937/07/06)

Carothers, W.H. (E.I. du Pont) US 2,072,867 (1937/03/09)

Carothers, W.H.; Collins, A.M.; Kirby, J.E. (E.I. du Pont) US 2,066,330 (1937/01/05)

Biographical References:

Kauffman, G.B. *Chem. Intell.* **July 1996**, 49

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Adams, R. *Biog. Memoirs Natl. Acad. Sci. USA* **1939**, 20, 293

Comte Louis Marie Hilaire Bernigaud Chardonnet de Grange

1 May 1839 - 12 March 1924

French, b. Besançon, France

Artificial silk (rayon)

Founded Chardonnet Silk Factory in Besançon (1890)

Chardonnet, L. FR 165,349 (1884/05/12)

Chardonnet, L. *Compt. Rend.* **1918**, 166, 783

Chardonnet, L. *Compt. Rend.* **1918**, 167, 489

Biographical References:

Pogg. 6 (1), 428

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Parsons, J.L. *Ind. Eng. Chem.* **1925**, 17, 754

Bigourdan, G. *Compt. Rend.* **1924**, 178, 977

Robert Augustus Chesebrough

9 January 1837 - 8 September 1938

British-American, b. London, England

"Vaseline" (petroleum jelly) 1876

Founded Chesebrough Manufacturing Co. in Brooklyn, New York, USA

Biographical References:

Miles, W.D. *American Chemists and Chemical Engineers*, American Chemical Society: Washington, 1976

Michel Eugène Chevreul

31 August 1786 - 8 April 1889

French, b. Angers, France

Soap production (saponification)

Chevreul, M. *Ann. Mus. d'Hist. Nat.* **1813**, XX

Chevreul, M. *Mém. Mus. d'Hist. Nat.* **1815**, 1, 34; 183

Chevreul, M. *Mém. Mus. d'Hist. Nat.* **1815**, 2, 127; 175; 308

Chevreul, M. *Mém. Mus. d'Hist. Nat.* **1817**, 3, 135

Chevreul, M. *Mém. Mus. d'Hist. Nat.* **1818**, 4, 262

Chevreul, M. *Ann. Chim.* **1815**, 114[1], 225

Chevreul, M. *Ann. Chim.* **1815**, 1 [2], 372

Chevreul, M. *Ann. Chim.* **1816**, 2 [2], 339

Chevreul, M. *J. de Pharm.* **1816**, 2, 497; 549

Chevreul, M. *Ann. Chim.* **1823**, 23 [2], 16

Chevreul, M. *Recherches Chimiques sur les Corps Gras d'Origine Animale*, Paris, 1823

Moureu, C. *Bull. Soc. Chim. Fr.* **1925**, 37, 132

Principle of simultaneous colour contrast

Chevreul, M. *De la loi du contraste simultanées couleurs et l'assortiment des objets colorés*, Paris, 1839

Martel, Charles (transl.) *The Principles of Harmony and Contrast of Colours and Their Applications to the Arts*, London, 1854 (1st ed.); 1872 (3rd ed.)

Spranton, John (transl.) *The Laws of Contrast of Colour*, London, 1858

Chevreul, M. *Mem. l'Acad. Sci.* **1832**, 11, 447

Chevreul, M. *Compt. Rend.* **1858**, 47, 196

Chevreul, M. *Compt. Rend.* **1863**, 57, 713

Chevreul, M. *Compt. Rend.* **1864**, 58, 100

Chemistry of dyeing

Chevreul, M. *Mem. l'Acad. Sci.* **1838**, 15, 383

Chevreul, M. *Mem. l'Acad. Sci.* **1838**, 16, 41; 47; 53; 181

Chevreul, M. *Mem. l'Acad. Sci.* **1840**, 17, 835

Chevreul, M. *Mem. l'Acad. Sci.* **1845**, 19, 491

Chevreul, M. *Mem. l'Acad. Sci.* **1853**, 23, 17

Chevreul, M. *Mem. l'Acad. Sci.* **1854**, 24, 407; 409; 433; 511

Chevreul, M. *Mem. l'Acad. Sci.* **1861**, 33, 3 - 936

Biographical references:

Pogg. 1, 432; 3, 267; 4, 244; 6 (1), 436
Berthelot, M. *Mem. de l'Acad. Sci.* **1904**, 47, 388
Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag:
Frankfurt, 1989
Hofmann, A.W. *Chem. Ber.* **1889**, 22, 1163
Bourgougnon, A. *J. Am. Chem. Soc.* **1889**, 11, 71
Armstrong, H.E. *Nature* **1925**, 116, 750
Lemay, P.; Oesper, R.E. *J. Chem. Educ.* **1948**, 25, 62
Kersaint, G. *Bull. Soc. Chim. Fr.* **1964**, 1656
Partington, J.R., *A History of Chemistry*, Vol. IV, Macmillan and Co., Ltd.:
London, 1964, p. 246 - 249
Costa, A.B. in Gillispie, Charles Coulston (ed.), *Dictionary of Scientific Biography*,
Charles Scribner & Sons: New York, 1981, Vol. 3, 240

Costa, A.B. *Michel Eugene Chevreul: pioneer of organic chemistry*, Madison,
Wisconsin, 1962

Carl Friedrich Claus

German, b. ?

Claus process

Claus, C.F. *Chem. Ber.* **1882**, 15, 744
Claus, C.F. *Chem. Ber.* **1883**, 16, 2325
Claus, C.F. *Chem. Ber.* **1884**, 17 (3), 509
Claus, C.F. British Patents: GB 3608 (1882/07/29); GB 5070 (1883); GB
5959 (1883)
Claus, C.F. German Patents: DE 17399 (1881/08/26); DE 28758
(1883/11/08)

Claus-Chance process

Claus, C.F., British Patent: GB 5958 (1883)
Chance, A.M.; Chance, J.F., British Patent: GB 8666 (1888)

Biographical references:

Charles Frederick Cross

11 December 1855 - 15 April 1935

British, b. Brentford, Middlesex, England

"Viscose"

Founded Viscose Syndicate in Kew, England (1893)

Cross, C.F.; Bevan, E.J.; Beadle, C. *Chem. Ber.* **1893**, 26, 988

Cross, C.F.; Bevan, E.J.; Beadle, C. DE 70,999 (1893/01/13)

Dissolution of cotton or wood cellulose as cellulose xanthate

Cross, C.F.; Bevan, E.J.; Beadle, C. GB 8,700 (1893/04/08)

Cellulose fiber; cellulose nitrate

Cross, C.F.; Bevan, E.J. *Chem. Soc. Trans.* **1889**, 55, 199

Cross, C.F.; Bevan, E.J. *Chem. Soc. Trans.* **1890**, 57, 1

Cross, C.F.; Bevan, E.J. *Chem. Ber.* **1891**, 24, 861

Cross, C.F.; Bevan, E.J.; Beadle, C. *Chem. Soc. Trans.* **1893**, 63, 837

Cross, C.F.; Bevan, E.J.; Beadle, C. *Chem. Ber.* **1894**, 27, 1061

Cross, C.F.; Bevan, E.J.; Beadle, C. *Chem. Soc. Trans.* **1895**, 67, 433

Cross, C.F.; Bevan, E.J. *Chem. Ber.* **1896**, 29 (4), 312; 461

Luck, A.; Cross, C.F. *Soc. Chem. Ind. J.* **1900**, 19, 642

Cross, C.F.; Bevan, E.J. *Chem. Ber.* **1901**, 34, 1513

Cross, C.F.; Bevan, E.J.; Beadle, C. *Chem. Soc. Trans.* **1901**, 79, 366

Cross, C.F.; Bevan, E.J. *Chem. Ber.* **1905**, 38, 1859; 3531

Cross, C.F.; Bevan, E.J. *Chem. Ber.* **1907**, 40, 3119

Cross, C.F.; Bevan, E.J.; Beadle, C. *Chem. Soc. Trans.* **1911**, 99, 1450

Biographical References:

Pogg. 4, 283; 5, 250; 6 (1), 496

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Armstrong, E.F. *Obit. Not. Fellows Roy. Soc.* **1932 - 1935**, 1, 459

Dorée, C. *J. Chem. Soc.* **1935**, 1337

Erik Christian Clemmensen

1876 - 21 May 1941

Danish-American, b. Odense, Denmark

Efficient synthesis of coumarin for use as preservative in canned meats

Clemmensen, E. (Monsanto Chem. Works) GB 373,490 (1932/05/26)

Clemmensen, E. (Monsanto Chem. Co.) US 1,945,182 (1934/01/30)

Clemmensen, E. (Monsanto Chem. Co.) US 1,945,184 (1934/01/30)

Biographical references:

Curr. Biog. **1941**, 156

Morris, Peter Biographies of Chemists, Royal Society of Chemistry,
<http://www.chem.qmw.ac.uk/rschg/biog.html>

Sir James Dewar

20 September 1842 - 27 March 1923

Scottish, b. Kincardine-on-Forth, Scotland

Cordite

Biographical References:

Armstrong, H.E., *J. Chem. Soc.* **1928**, 1066

Partington, J.R., *A History of Chemistry*, Vol. IV, Macmillan and Co., Ltd.:
London, 1964, p. 904

Paul Ehrlich

14 March 1854 - 20 August 1915

German, b. Strehlen, Germany (now Strzelin, Poland)

Development of arsenic compounds to treat diseases

Ehrlich, P.; Bertheim, A. *Chem. Ber.* **1907**, 40, 3292

Ehrlich, P.; Bertheim, A. *Chem. Ber.* **1910**, 43, 917

Ehrlich, P. *Verh. 27. Kongr. Innere Med., Wiesbaden* **1910**, 27, 226

Ehrlich, P. *Deutsch. Med. Wschr.* **1910**, 36, 1893

Ehrlich, P. *Munch. Med. Wschr.* **1911**, 58, 1; 2481

Development of chemotherapy

Ehrlich, P. *J. Roy. Inst. Public Health* **1907**, 15, 449

Ehrlich, P. *Chem. Ber.* **1909**, 42, 17

Ehrlich, P. *Z. Angew. Chem.* **1910**, 23, 2

Ehrlich, P. *Folia Serol.* **1911**, 7, 697

Ehrlich, P. *Lancet* **1913**, 2, 445

Ehrlich, P. *Brit. Med. J.* **1913**, 2, 353

Biographical references:

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag:
Frankfurt, 1989

Dolman, C.E. in Gillispie, Charles Coulston (ed.), *Dictionary of Scientific
Biography*, Charles Scribner & Sons: New York, 1981, Vol. 4, 295

Muir, R. *J. Pathol. Bacteriol.* **1915**, 20, 349

Sachs, H. *Munch. Med. Wschr.* **1915**, 62, 1357

Von Wasserman, A. *Deutsch. Med. Wschr.* **1915**, 41, 1103; 1135

Weinberg, A. *Chem. Ber.* **1916**, 49, 1223
Browning, C.H. *Br. Med. J.* **1915**, 2, 349
Anon. *Lancet* **1915**, 2, 525
Anon. *J. Am. Med. Assoc.* **1915**, 65, 814; 1123
Arrhenius, S.; Madsen, T. *Z. Physik. Chem.* **1903**, 44, 7

Constantin Fahlberg

22 December 1850 - 15 August 1910

Russian-American, b. Tambov, Russia

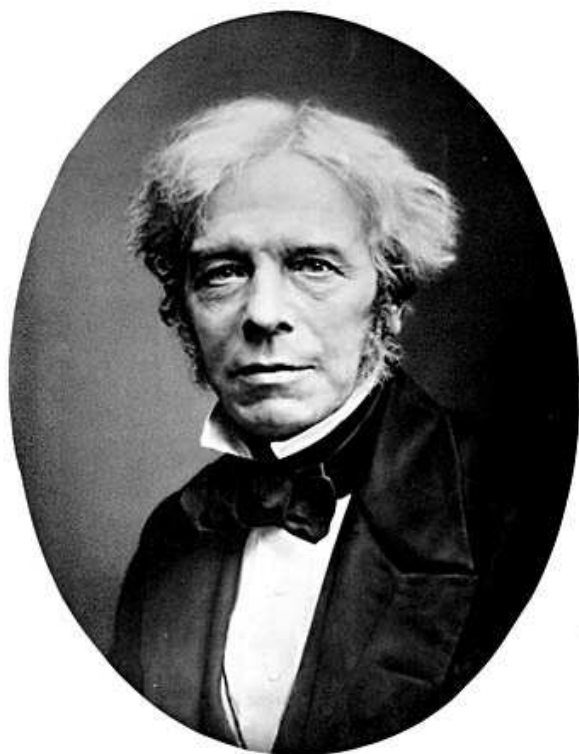
Remsen-Fahlberg synthesis of saccharin

Remsen, I.; Fahlberg, C. *Am. Chem. J.* **1879**, 1, 170; 426
Fahlberg, C.; Remsen, I. *Chem. Ber.* **1879**, 12, 469
Fahlberg, C. *Soc. Chem. Ind. J.* **1887**, 6, 587
Fahlberg, C. DE 35211 (1884)
Fahlberg, C. DE 35933 (1885)
Fahlberg, C. DE 64624 (1891)
Fahlberg, C. DE 103298 (1895)

Biographical references:

Pogg. 3, 425; 4, 402; 5, 353
Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag:
Frankfurt, 1989
Will, W. *Chem. Ber.* **1910**, 43, 2784
Anon. *Chem. Ztg.* **1910**, 34, 888
Kauffman, G.B.; Priede, P.M. *Ambix* **1978**, 25, 191

Michael Faraday



22 September 1791 - 25 August 1867

British, b. Newington Butts, Surrey, near London, England

Liquefaction of carbon dioxide

Faraday, M. *Phil. Trans. Roy. Soc. London* **1823**, 113, 193

Invention of hydraulic pump

Faraday, M. *Phil. Trans. Roy. Soc. London* **1845**, 135, 155

Biographical References:

Anon., *J. Chem. Soc.* **1868**, 21, xxi

Proceedings Roy. Soc. London **1868-1869**, 17, i-lxviii signed by H B J

Farber, Eduard (ed.), *Great Chemists*, Interscience Publishers: New York, 1961

Abbott, David (ed.), *The Biographical Dictionary of Scientists: Chemists*, Peter BedrickBooks: New York, 1983

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James, F.A.J.L. *ACS Symp. Ser.* **1989**, 390, 32

Cable, M.; Smedley, J.W. *Glass Technol.* **1989**, 30, 39

Franz Joseph Emil Fischer

19 March 1877 - 1 December 1947

German, b. Freiburg im Breisgau, Germany

Fischer-Tropsch process

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Joseph Louis Gay-Lussac



6 December 1778 - 9 May 1850

French, b. St. Léonard, Haute Vienne, France

Gay-Lussac tower (1827)

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Karl Hermann Geib

12 March 1908 – 21 July 1949

German, b. Berlin, Germany

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13 August 1913 -

American, b. Union, South Carolina, USA

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John Glover

February 1817 - 1 May 1902

British, b. Wallsend, near Newcastle-upon-Tyne, England

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Hans Goldschmidt

18 January 1861 - 21 May 1923

German, b. Berlin, Germany

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30 October 1908 -

American, b. Ypsilanti, Michigan, USA

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American, b. New Haven, Connecticut, USA

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German, b. Frankfurt, Germany

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Fritz Haber



9 December 1868 - 29 January 1934

German, b. Breslau, Germany, now Wroclaw, Poland

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Sahachiro Hata

1873 - 25 November 1938

Japanese, b. Tsumo, Japan

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see Paul Ehrlich

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Willibald Hentschel

German, b. Dresden, Germany

Synthesis of isocyanates from phosgene and amines

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Eduard Hepp

11 June 1851 – 18 June 1917

German, b. Strasburg, Germany (now France)

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see Alfred Kast

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Karl Heumann

10 September 1850 - 5 August 1893

German, b. Darmstadt, Germany

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German, b. Berlin, Germany

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Heinrich Hock

9 April 1887 - ?

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John Wesley Hyatt

1837 - 1920

American, b. Starkey, New York, USA

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German, b. Berlin, Germany

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Robert John Kane

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Irish, b. Dublin, Ireland

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Alfred Kast

25 July 1856 - 7 January 1903

German, b. Illenau near Achern, Baden, Germany

see Eugen Baumann

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German, b. Darmstadt, Germany

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British, b. Manchester, England

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Josef Klarer

10 January 1898 - 21 June 1953

German, b. Munich, Germany

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Fritz Klatte

28 March 1880 - 11 February 1934

German, b. Diepholz, Niedersachsen, Germany

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Adolphe Wilhelm Hermann Kolbe

27 September 1818 - 25 November 1884

German, b. Elliehausen, near Göttingen, Germany

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28 December 1814 - 31 August 1900

British, b. Rothamsted, St. Albans, England

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Russian-Polish, b. Lublin (Dubny), Poland

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Nicolas LeBlanc

6 December 1742 - 16 January 1806

French, b. Ivoyle-le-Pre, Berry, France

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French, b. ?

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Carl Theodore Liebermann

23 February 1842 - 28 December 1914

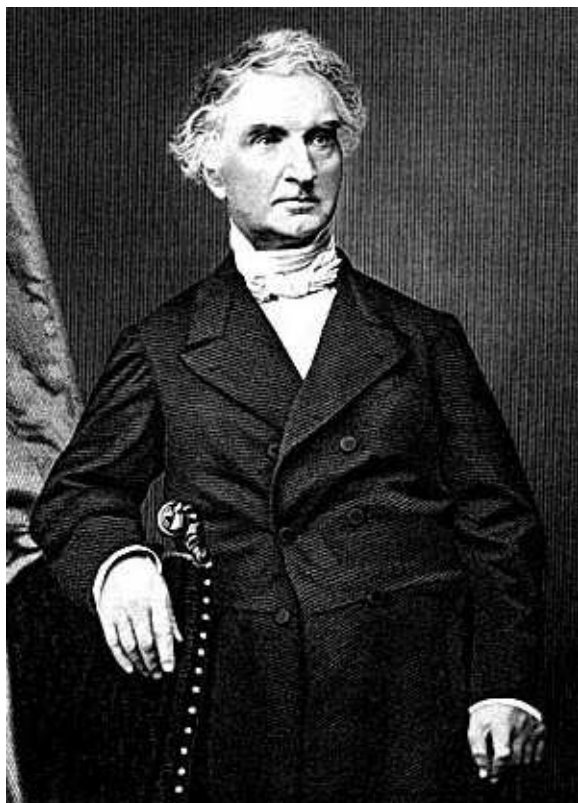
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Justus Freiherr von Liebig



12 May 1803 - 18 April 1873

German, b. Darmstadt, Germany

Use of nitrogenous compounds such as ammonia as fertilizers

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Carl von Linde

11 June 1842 - 16 November 1934

German, b. Berndorf, Bayern, Germany

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Sir Reginald Patrick Linstead

28 August 1902 - 22 September 1966

British, b. London, England

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Charles Blachford Mansfield

8 May 1819 - 26 February 1855

British, b. Rowner, Hampshire, England

Distillation of benzene from coal tar; hydrocarbons from coal tar
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Andreas Sigismund Marggraf

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German, b. Berlin, Germany

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Robert Henry Mazur

15 June 1924 -

American, b. Indianapolis, Indiana, USA

Discovery of aspartame as artificial sweetener

Schlatter, J.M. ZA 6,702,190 (1968/11/04)

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Thomas Midgley Jr.

18 May 1889 - 2 November 1944

American, b. Beaver Falls, Pennsylvania, USA

Freons as refrigerants

Midgley, T. Jr.; Henre, A.L. *Ind. Eng. Chem.* **1930**, 22, 542

Tetraethyllead as octane enhancer and antiknocking agent in fuel

Midgley, T. Jr. *Ind. Eng. Chem.* **1922**, 14, 894

Midgley, T. Jr. *Ind. Eng. Chem.* **1939**, 31, 504

Biographical references:

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Fritz Mietzsch

28 May 1896 - 29 November 1958

German, b. Dresden, Germany

see Josef Klarer

Biographical references:

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Alwin Mittasch

27 December 1869 - 4 June 1953

German, b. Großdehsa, near Löbau, Germany

Manufacture of methanol from CO and H₂ with iron oxide

Mittasch, A.; Pier, M. (I.G. Farben) DE 565,309 (1923/09/22)

Mittasch, A.; Pier, M.; Müller C. (I.G. Farben) US 1,791,568 (1931/02/10)

Mittasch, A.; Pier, M. (I.G. Farben) US 1,569,775 (1926/01/12)

Mittasch, A.; Pier, M.; Winkler, W. (I.G. Farben) US 1,558,559 (1925/10/27)

Biographical references:

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Pietsch, E. *Z. Angew. Chem.* **1939**, 52, 719

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Holderman, K. *Chem. Ber.* **1957**, 90, xli

Farber, E. *Chymia* **1966**, 11, 157

Charles Moureu

19 April 1863 - 13 June 1929

French, b. Moureux, Basses-Pyrénées, France

Discovery of acrylonitrile

Moureu, C. *Ann. Chim. Phys.* **1894**, 2, 187

Biographical references:

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Paul Hermann Müller

12 January 1899 - 4 June 1953

Swiss, b. Olten, near Solothurn, Switzerland

Physiology and Medicine Nobel Prize 1948

Use of DDT as an insecticide

Müller, P. (Geigy) Swiss 129,315 (1941)

Müller, P. (Geigy) Swiss 129,314 (1941)

Müller, P. (Geigy) US 2,397,802 (1946)

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Giulio Natta



16 February 1903 - 1 May 1979

Italian, b. Imperia, Liguria, near Genoa, Italy

Nobel Prize Chemistry 1963

Ziegler-Natta catalyst (titanium tetrachloride, triethylaluminum)

Ziegler, K.; Holzkamp, E.; Breil, H.; Martin, H., *Angew. Chem.* **1955**, 67, 426

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Alfred Nobel

21 October 1833 - 10 December 1896

Swedish, b. Stockholm, Sweden

Manufacture of nitroglycerin and dynamite

Nobel, A. *Compt. Rend.* **1865**, 61, 122; 604

Nobel, A. *Pharmaceut. J.* **1868 - 1869**, 28, 367

Biographical references:

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Friedrich Wilhelm Ostwald



2 September 1853 - 4 April 1932

Latvian, b. Riga, Latvia

Nobel Prize Chemistry 1909

Production of nitric acid by ammonia oxidation

Ostwald, W. US 858,904 (1907/06/04)

Ostwald, W. US 858,904 (1907/07/02)

Biographical References:

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Alexander Parkes

29 December 1813 - 29 June 1890

British, b. Birmingham, England

"Xylonite", "Parkesine" (a form of celluloid) 1866

Parkes, A. *J. Soc. Arts* **1865**, 14, 1891

Parkes, A. GB 709 (1866)

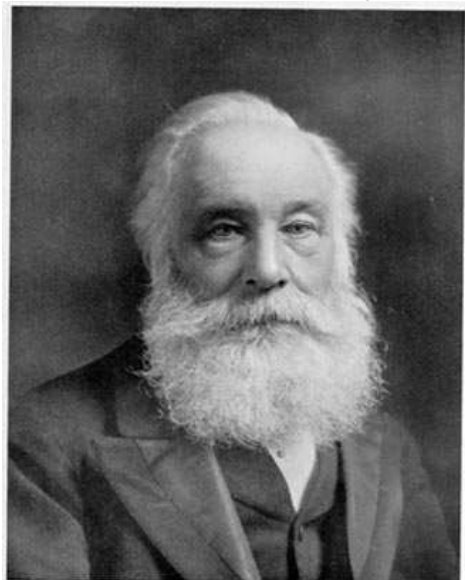
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Sir William Henry Perkin



*Yours sincerely
W. H. Perkin*

12 March 1838 - 14 July 1907

British, b. Shadwell, South London, England

Synthesis of mauveine dye

Perkin, W.H. GB 1984 (1856)

Perkin, W.H. *J. Chem. Soc.* **1862**, 232

Perkin, W.H. *J. Chem. Soc.* **1896**, 69, 596

Biographical references:

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Peregrine Phillips, Jr.

British, b. Bristol, England

Contact process to manufacture sulphuric acid (1831)

Phillips, P. Jr. GB 6096 (14/09/1831)

Biographical references:

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Cook, Sir Ernest *Nature* **1926**, 117, 419

Raoul Pierre Pictet

4 April 1846 - 27 July 1929

Swiss, b. Geneva, Switzerland

Liquefaction of gases (oxygen, hydrogen, nitrogen, air)

Pictet, R. *Compt. Rend.* **1877**, 85, 1214

Pictet, R. *Compt. Rend.* **1878**, 86, 37; 106

Biographical references:

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Friedrich August Fritz Raschig

8 June 1863 - 4 February 1928

German, b. Brandenburg, Germany

Raschig process to manufacture hydroxylammonium sulphate

Raschig, F. DE 216,747 (1908); US 1,010,177 (1911)

Raschig, F. *Chem. Ber.* **1899**, 32, 394

Raschig, F. *Chem. Ber.* **1906**, 39, 245

Raschig-Hooker process to manufacture phenol

Raschig, F. *Z. Angew. Chem.* **1915**, 28 (1), 409

Biographical References:

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Rosenheim, A., *Chem. Ber.* **1929**, 62A, 109

Anon. *Z. Angew. Chem.* **1928**, 41, 167

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W. Raydt

Industrial manufacture of liquid carbon dioxide

Raydt, W. *Polytech. Notizbl.* **1882**, 37, 196

Raydt, W. DE 33,168 (1885)

Biographical references:

Cortes F. Reed

18 September 1891 - August 1972

Sulfochlorination process

Reed, C.F. U.S. Pat. 2,046,090 (1936/06/30) CAN 3 0 :5593(3)

Reed, C.F. U.S. Pat. 20,968 (1939/01/03) CAN 3 3 :2911(3)

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Biographical references:

Personal communication, Dr. Otto-Albrecht Neumüller, October 2002

Ira Remsen

10 February 1846 - 4 March 1927

American, b. New York City, New York, USA

see Constantin Fahlberg

Biographical references:

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Walter Reppe

29 July 1892 - 27 July 1969

German, b. Ort Göringen bei Eisenach, Thürigen, Germany

Reppe process

Reppe, W. DE 510,712 (I.G. Farben) 1928/01/22 CAN 2 5 :964

Reppe, W. DE 528,360 (I.G. Farben) 1929/04/05 CAN 2 5 :5175

Reppe, W. DE 550,403 (I.G. Farben) 1928/12/25 CAN 2 6 :4825

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Reppe, W. (BASF) *Chem. Ing. Tech.* **1950**, 22, 361; 437; 527

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Eugene George Rochow

4 October 1909 - 21 March 2002

American, b. Newark, New Jersey, USA

Rochow synthesis of silicone polymers

U.S. Pat. 2258218 (1941/10/07) CAN 3 6 :858(1)

U.S. Pat. 2352974 (1944/07/04) CAN 3 9 :225(8)

U.S. Pat. 2383817 (1945/08/28) CAN 3 9 :5556(8)

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John Roebuck

1718 - 17 July 1794

British, b. Sheffield, Yorkshire, England

Lead chamber for manufacture of sulphuric acid (1746)

Founded Prestonpans sulfuric acid works (1749)

Founded Carron Iron Works, near Falkirk (1760)

Biographical references:

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Clow, A.; Clow, N.L. *Chem. Ind.* **1942**, 20, 497

Otto Röhm

14 March 1876 - 17 September 1939

German, b. Öhringen, Württemberg, Germany

Polyacrylonitrile (plexiglass)

Röhm, O. *Chem. Fabrik* **1936**, 5, 29

Röhm, O. (Rohm & Haas) FR 814,353 (1937/06/21)

Röhm, O.; Trommsdorff, E. (Rohm & Haas) US 2,171,765 (1939/09/05)

Röhm, O. (Rohm & Haas) FR 843,622 (1939/07/06)

Bauer, W.; Trommsdorff, E. (Rohm & Haas) US 2,209,246 (1940/07/23)

Biographical references:

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

Paul Schlack

22 December 1897 - 19 August 1987

German, b. Stuttgart, Germany

First spinnable polymer by polycondensation of caprolactam

Schlack, P. (I.G. Farben) US 2,241,321 (1941/05/06)

Schlack, P. (E.I. du Pont) US 2,227,152 (1942/03/24)

Schlack, P. (Alien Property Custodian) US 2,303,177 (1942/11/24)

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James Myron Schlatter

27 July 1930 -

American, b. Brazil, Indiana, USA

see Robert Henry Mazur

Biographical references:

American Men of Science, Physical and Biological Sciences, 11th ed., R.R. Bowker: Providence, N.J., 1967

Christian Friedrich Schönbein

18 October 1799 - 29 August 1868

German, b. Metzingen, Wurttemberg, Germany

Gun cotton (Schiesswolle)

Schönbein, C.F. US 4,874 (1846)

Schönbein, C.F. *Compt. Rend.* **1846**, 23, 612; 678

Biographical references:

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Oesper, R.E. *J. Chem. Educ.* **1929**, 6, 432; 670

Waldo Lonsbury Semon

10 September 1898 - ?

American, b. Demopolis, Alabama, USA

Vinyl polymers, Koroseal

Semon, W.L. (B.F. Goodrich) GB 312,630 (1928/05/29)

Semon, W.L. (B.F. Goodrich) US 1,929,453 (1933/10/10)

Semon, W.L. (B.F. Goodrich) US 1,983,949 (1934/12/11)

Brous, S.L.; Semon, W.L. *Ind. Eng. Chem.* **1935**, 27, 667

Schoenfeld, F.K.; Semon, W.L. (B.F. Goodrich) US 2,259,180 (1941/10/14)

Semon, W.L. (B.F. Goodrich) US 2,376,015 (1945/05/15)

Semon, W.L. (B.F. Goodrich) US 2,384,568 (1945/09/11)

Semon, W.L. (B.F. Goodrich) US 2,384,572 (1945/09/11)

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John Clark Sheehan

23 September 1915 - 21 March 1992

American, b. Battle Creek, Michigan, USA

Synthesis of penicillin

Sheehan, J.C.; Henery-Logan, K.R. *J. Am. Chem. Soc.* **1957**, 79, 1262

Biographical references:

Corey, E.J.; Roberts, J.D. *Biog. Mem. Natl. Acad. Sci.* **1995**, 68, 291

Juergen Smidt

German, b. ?

see Alexander Wacker

Biographical references:

Ascanio Sobrero

12 October 1812 - 25 May 1888

Italian, b. Casale, Italy

Discovery of nitroglycerin

Sobrero, A. *Mem. Accad. delle Scienze di Torino*, Ser. 2, **1845 - 1847**, 10, 195

Sobrero, A. *Compt. Rend.* **1847**, 24, 247

Biographical references:

Pogg. 2, 952; 3, 1263

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Ernest Solvay

16 April 1838 - 26 May 1922

Belgian, b. Rebecq-Rognon, near Brussels, Belgium

Solvay process

GB 3131 (1863); GB 1525 (1872); GB 2143 (1876); GB 999 (1904)

Biographical references:

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Jerome S. Spevack

Geib-Spevack (Girdler) hydrogen sulfide process for manufacturing deuterium oxide

See Karl Hermann Geib

Biographical references:

Sir Joseph Swan

31 October 1828 - 27 May 1914

British, b. Sunderland, England

Denitration of cellulose with ammonium sulphide

Swan, J. GB 5,978 (1883/12/31)

Biographical references:

Pogg. 5, 1233

Pötsch, W.R.; Fischer, A.; Müller, W., *Lexikon bedeutender Chemiker*, Verlag: Frankfurt, 1989

W.G. *Proc. Roy. Soc. London* **1920**, 96, ix

Sir William Augustus Tilden

15 August 1842 - 11 December 1926

British, b. London, England

Synthesis of isoprene from turpentine and its polymerization

Tilden, W.A. *J. Chem. Soc.* **1878**, 33, 247

Tilden, W.A. *Chem. Ber.* **1879**, 12, 848

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J.C.P. *Proc. Roy. Soc. London A* **1927 - 1928**, 117, I

Wilhelm Traube

10 January 1866 - 28 September 1942

German, b. Ratibor, Schlesien (now Racibórz, Poland)

Synthesis of purine bases (e.g., caffeine)

Traube, W. *Chem. Ber.* **1900**, 33, 3035

Biographical references:

Pogg. 4, 1520; 5, 1266; 6(4), 2683

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Pringsheim, H. *Z. Angew. Chem.* **1926**, 39, 61

Krohnke, F. *Nachr. Chem. Techn.* **1961**, 9, 257

Hans Tropsch

7 October 1889 - 8 October 1935

Czech-German, b. Planá, Czech Republic

Fischer-Tropsch process

see Franz Joseph Emil Fischer

Biographical references:

Ferles, M., *Chemie (Prague)* **1958**, 10, 612

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Tramm, H. *Chem.-Ing. Tech.* **1952**, 24, 181

Anon. *Mon. Petrole Roumain* **1935**, 36, 1581

François Eugene Turpin

1848 - 24 January 1927

French, b. Rosedael Nord, France

Inventor of melinite (a form of picric acid used as a bursting charge in shells) (1885)

Biographical References:

Pogg. 6 (4), 2708

Boyer, J. *La Nature* **1927**, 55, ?

Alexander Wacker

German, b. ?

Founder of Wacker-Chemie GmbH in 1914

Wacker reaction/process; Wacker-Tsuji oxidation

Smidt, J.; Hafner, W.; Jira, R.; Sedlmeier, J.; Sieber, R.; Ruttinger, R.; Kojer, H. *Angew. Chem.* **1959**, 71, 176

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John Rex Whinfield

16 February 1901 - 6 July 1966

British, b. ?

Poly(ethylene terephthalate)

Whinfield, J.R.; Dickson, J.T. (ICI) GB 578,079 (1946/08/29)

Whinfield, J.R.; Dickson, J.T. (E.I. du Pont) US 2,465,319 (1949/03/22)

Biographical references:

Thomas Leopold Willson

14 March 1860 - 21 December 1915

Canadian-American, b. Princeton, Ontario

Industrial processes to manufacture acetylene and calcium carbide

Willson, T.L.; Suckert, J.J. *J. Franklin Inst.* **1895**, 139, 321

Morehead, J.T.; de Chalmot, G. *J. Am. Chem. Soc.* **1896**, 18, 311

Willson, T.L. CH9887 (1895-08-31)

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American Chemical Society, *Discovery of the Commercial Processes for Making Calcium Carbide and Acetylene*, Washington, D.C., 1999

Robert Burns Woodward



10 April 1917 - 8 July 1979

American, b. Boston, Massachusetts, USA

Nobel Prize Chemistry 1965

Synthesis of quinine

Woodward, R.B.; Doering, W.E. *J. Am. Chem. Soc.* **1944**, 66, 849

Woodward, R.B.; Doering, W.E. *J. Am. Chem. Soc.* **1945**, 67, 860

Synthesis of cortisone

Woodward, R.B.; Sondheimer, F.; Taub, D. *J. Am. Chem. Soc.* **1951**, 73, 4057

Synthesis of cholesterol

Woodward, R.B.; Sondheimer, F.; Taub, D. *J. Am. Chem. Soc.* **1951**, 73, 3548

Synthesis of lysergic acid

Kornfeld, E.C.; Fornefeld, E.J.; Kline, G.B.; Mann, M.J.; Jones, R.G.; Woodward, R.B. *J. Am. Chem. Soc.* **1954**, 76, 5256

Kornfeld, E.C.; Fornefeld, E.J.; Kline, G.B.; Mann, M.J.; Morrison, D.E.; Jones, R.G.; Woodward, R.B. *J. Am. Chem. Soc.* **1956**, 78, 3087

Synthesis of strychnine

Woodward, R.B.; Cava, M.P.; Ollis, W.D.; Hunger, A.; Daeniker, H.U.; Schenker, K.J. *Am. Chem. Soc.* **1954**, 76, 4749

Woodward, R.B. *Experientia* **1955**, 12 (Suppl. 2), 213

Woodward, R.B.; Cava, M.P.; Ollis, W.D.; Hunger, A.; Daeniker, H.U.; Schenker, K. *Tetrahedron* **1963**, 19, 247

Synthesis of chlorophyll

Woodward, R.B.; Ayer, W.A.; Beaton, J.M.; Bickelhaupf, F.; Bonnett, R.; Buchschacher, P.; Closs, G.L.; Dutter, H.; Hanneh, J. *J. Am. Chem. Soc.* **1960**, 82, 3800

Woodward, R.B. *Angew. Chem.* **1960**, 72, 651

Woodward, R.B. *Pure Appl. Chem.* **1961**, 2, 383

Synthesis of colchicine

Woodward, R.B. *Harvey Lectures* **1965**, 59, 31

Synthesis of vitamin B12

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

Synthesis of reserpine

Woodward, R.B.; Bader, F.E.; Bickel, H.; Frey, A.J.; Kierstead, R.W. *J. Am. Chem. Soc.* **1956**, 78, 2023

Synthesis of lanosterol

Woodward, R.B.; Patchett, A.A.; Barton, D.H.R.; Ives, D.A.; Kelly, R.B. *J. Am. Chem. Soc.* **1954**, 76, 2852

Synthesis of tetracycline

Woodward, R.B. *Pure Appl. Chem.* **1963**, 6, 561

Biographical References:

Todd, Lord; Cornforth, Sir J., *Biog. Memoirs Fellows Roy. Soc.* **1981**, 27, 629

Anon., *Chem. Eng. News* **1998**, 76(2), 171

Landry, D.W. in James, Laylin K. (ed.), *Nobel Laureates in Chemistry 1901 - 1992*, American Chemical Society: Washington, DC, 1993, p. 462

Blout, E. *Biog. Mem. Natl. Acad. Sci.* **2001**, 80, 367

Woolwich

Named after Woolwich, England (borough in East London, now part of Greenwich)

Woolwich process

Mente; Will, W. *J. Soc. Chem. Ind.* **1909**, 28, 748

Gibson, W.H.; McCall, R. *J. Soc. Chem. Ind.* **1920**, 39, 172

Robertson, R. *Nature* **1920**, 105, 710; 743

Charles Adolphe Wurtz



26 November 1817 - 12 May 1884

French, b. Wolfisheim, near Strasbourg, France

Discovery of urethanes by reaction of isocyanates with alcohols

Wurtz, A. *Compt. Rend.* **1851**, 32, 414

Discovery of ethylene oxide

Wurtz, A. *Ann. Chem.* **1859**, 110, 125

Wurtz, A. *Compt. Rend.* **1859**, 48, 101

Wurtz, A. *J. Chem. Soc.* **1862**, 15, 387

Wurtz, A. *Ann. Chim. Phys.* **1863**, 69, 317

Synthesis of phenol from benzene

Wurtz, A. *Compt. Rend.* **1867**, 64, 749

Biographical references:

Farber, Eduard (ed.), *Great Chemists*, Interscience Publishers: New York, 1961

Abbott, David (ed.), *The Biographical Dictionary of Scientists: Chemists*,

Peter Bedrick Books: New York, 1983

Partington, J.R., *A History of Chemistry*, Vol. IV, Macmillan and Co., Ltd.:

London, 1964, p. 477

Everett B. Yelton

American ?, b. ?

Fluoropolyethylene (teflon)

Yelton, E.B. (E.I. du Pont) *Plastics & Resins* **1946**, 5, 14; 36
Yelton, E.B. *Trans. Electrochem. Soc.* **1946**, 90, 331

Biographical references:

Othmar Zeidler

1859 - 17 June 1911

German, b. ?

Synthesis of DDT

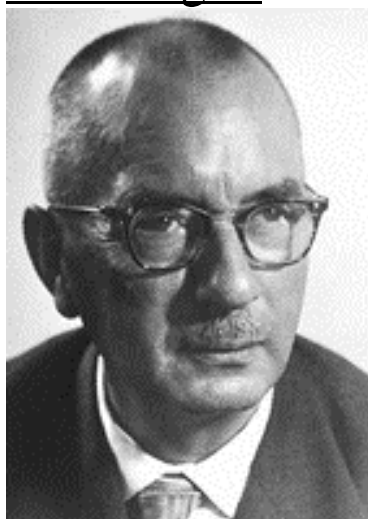
Zeidler, O. *Chem. Ber.* **1874**, 7, 1180

Biographical references:

Anon. *Pharmazeutische Post* **1911**, 44, 519

Anon. *Chem. Ztg.* **1911**, 35, 718

Karl Ziegler



26 November 1898 - 11 August 1973

German, b. Helsa, Oberhessen, near Kassel, Germany

Nobel Prize Chemistry 1963

Ziegler-Natta catalyst (titanium tetrachloride - triethylaluminum)

see Giulio Natta

Biographical References:

Bawn, C.E.H., *Biog. Memoirs Fellows Roy. Soc.* **1975**, 21, 569

Anon., *Chem. Eng. News* **1998**, 76(2), 171

Bonnesen, P.V. in James, Laylin K. (ed.), *Nobel Laureates in Chemistry 1901 - 1992*, American Chemical Society: Washington, DC, 1993, p. 449

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Timeline of Discoveries of Processes in Chemical Industry

YEAR	PROCESS	DISCOVERER	COUNTRY
1665	production of coal gas		England
1689	sugar extraction from sugar cane		North America
1746	lead chamber for manufacture of sulfuric acid	Roebuck, John	England
1747	sugar extraction from sugar beets	Marggraf, Andreas Sigismund	Germany
1789	patent for production of chlorine for bleaching	Berthollet, Claude	France
1790	soda ash (sodium carbonate)	LeBlanc, Nicolas	France
1794	decolourizing and deodourizing properties of charcoal		
1796	production of coal gas		United States
1813	soap production	Chevreur, Michel E.	France
1827	Gay-Lussac tower	Gay-Lussac, Joseph Louis	France
1831	contact process for manufacture of sulfuric acid	Phillips, Peregrine	England
1832	distillation equipment		
1837	manufacture of methanol from wood spirit	Kane, Robert John	Germany
1839	vulcanization of rubber	Goodyear, Charles	United States
1840	ammonia as fertilizer	Liebig, Justus	Germany
1842	patent for production of acid phosphates	Lawes, Sir John Bennet	England
1843	natural rubber from Malaysian rubber trees		
1844	making pulp from wood	Keller, Friedrich Gottlob	Germany
1846	gun cotton	Schoenbein, Christian Friedrich	Germany
1847	discovery of nitroglycerin	Sobrero, Ascanio	Italy
1849	distillation of benzene from coal tar	Mansfield, Charles Blachford	England
1851	Discovery of urethanes by reaction of isocyanates with alcohols	Wurtz, Adolphe	France
1854	Bechamp process to make aniline	Bechamp, Pierre Jacques Antoine	France
1855	nitrocellulose	Audemars, George	England
1856	Discovery of mauvein dye	Perkin, Sir William Henry	England
1859	Glover tower	Glover, John	England
1861	ammonia soda process	Solvay, Ernest	Belgium
1863	Discovery of barbiturates	Baeyer, Adolf von	Germany
1867	dynamite/nitroglycerin	Nobel, Alfred	Sweden
1867	production of phenol from benzene	Wurtz, A./Kekule, A.	Germany/ France
1868	synthesis of alizarin	Graebe, Charles/Liebermann, Carl	Switzerland
1869	celluloid plastic (addition of camphor to cellulose nitrate)	Hyatt, John Wesley/Parkes, Alexander	United States/England
1870	first commercial synthesis of alizarin	Graebe, Charles/Liebermann, Carl/Caro, H./Perkin, W.H.	Germany/ England
1870	acetic acid and acetone production from calcium acetate and wood		
1870	industrial process to make urea	Basaroff, Alexander I.	Germany

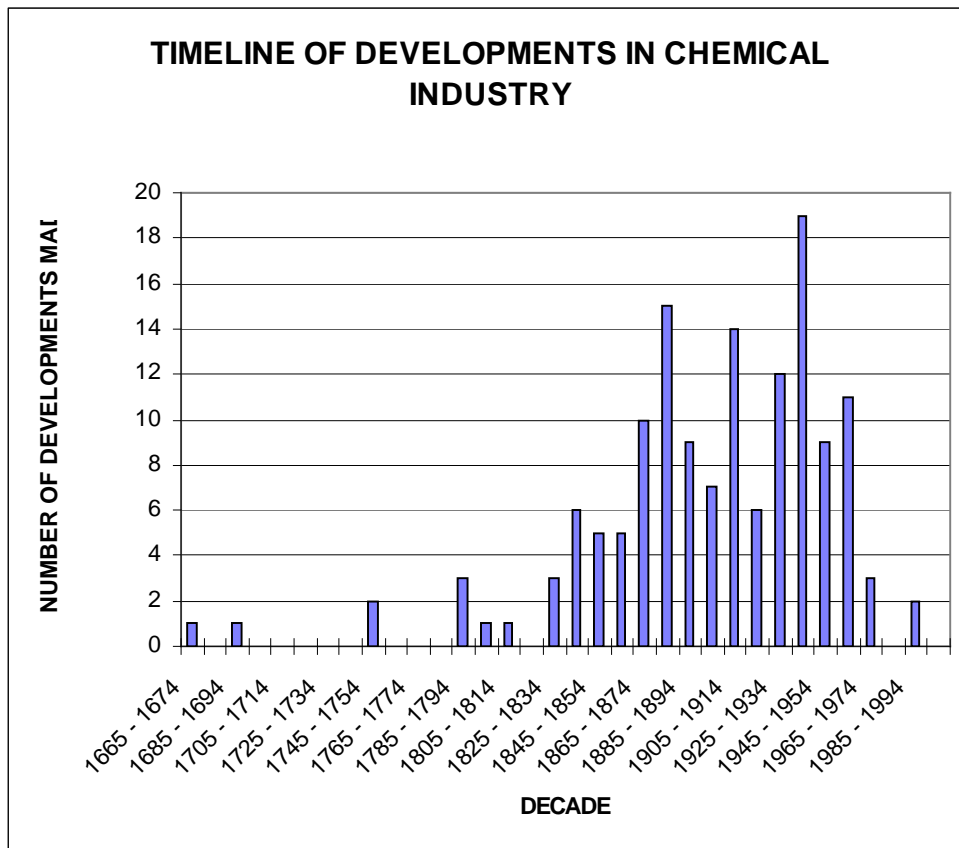
1872	production of carbon black		United States
1874	synthesis of DDT	Zeidler, Othmar	Germany
1874	Kolbe synthesis of aspirin	Kolbe, Adolphe	Germany
1876	Discovery of phthalein dyes	Baeyer, Adolf von	Germany
1876	petroleum jelly (Vaseline)	Chesebrough, Robert Augustus	United States
1877	liquefaction of nitrogen	Cailletet, Louis Paul/Pictet, Raoul	France
1878	synthesis of indigo	Baeyer, Adolph von	Germany
1878	Remsen-Fahlberg synthesis of saccharin	Remsen, Ira/ Fahlberg, Constantin	United States/ Germany
1878	synthesis of isoprene from turpentine; rubber from isoprene	Tilden, Sir William Augustus	England
1879	alkylation of hydrocarbons with AlCl ₃ and olefins	Balsohn, M.	Germany
1879	cordite	Abel, Sir F.A./Dewar, Sir James	England
1880	methyl methacrylate polymer	Kahlbaum, Georg W.A.	Switzerland
1882	industrial manufacture of liquid carbon dioxide	Raydt, W.	Germany
1883	denitration of nitrocellulose with ammonium sulfide	Swan, Sir Joseph	England
1883	Claus process	Claus, Carl Friedrich	Germany/ England
1884	kraft paper process	Dahl	Germany
1884	isocyanates from phosgene and amines	Hentschel, Willibald	Germany
1884	artificial silk (rayon)	Chardonnet, Count Hilaire de	France
1885	use of picric acid as a bursting charge in shells (melinite)	Turpin, Eugene	France
1886	discovery of 1,3-butadiene in cracked petroleum	Armstrong, Henry E./Miller, A.K.	England
1886	Discovery of acetanilide as an antipyretic	Kahn/Hepp, Eduard/Kast, A./Hinsberg, O.	Germany
1887	Discovery of sulphonic hypnotics	Baumann, Eugen/Kast, Alfred	Germany

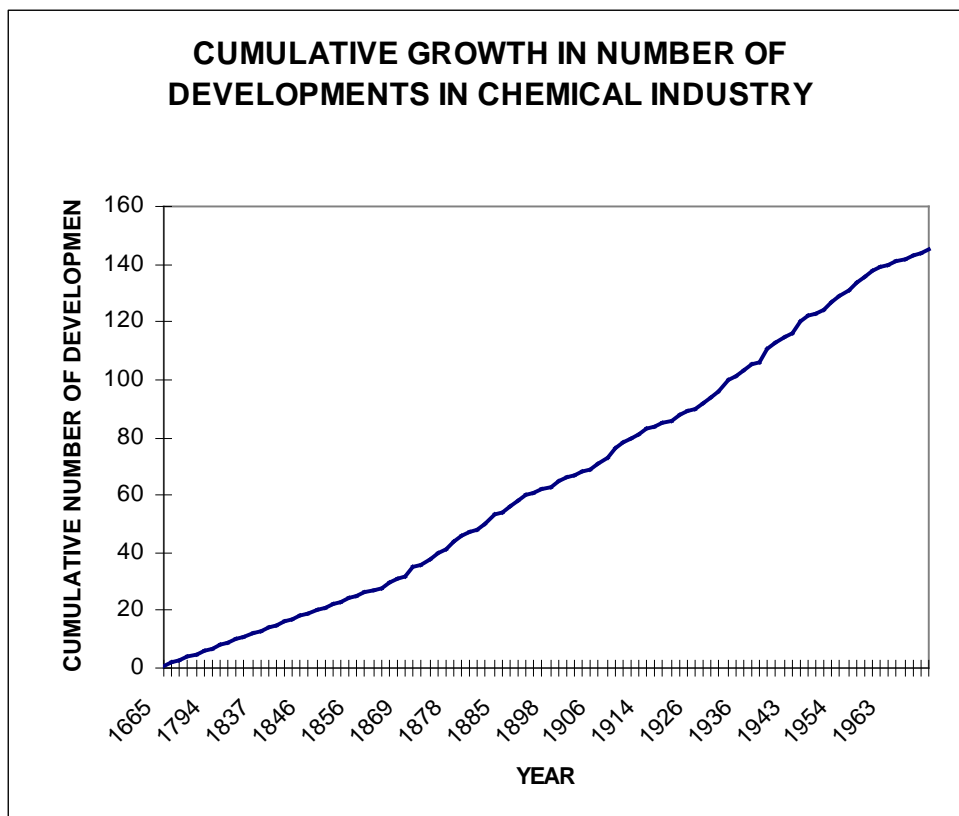
1887	commercialization of indigo	BASF	Germany
1890	commercialization of indigo	Heumann, Karl	Germany
1890	dissolution of cotton fiber in Schweitzer's reagent	Despeissis, L.H.	France
1892	industrial processes to manufacture acetylene and calcium carbide	Willson, Thomas Leopold	Canada
1893	dissolution of cotton or wood cellulose as cellulose xanthates (viscose)	Cross, C.F./Bevan, E.J./Beadle, C.	England
1898	continuous filament spinning process for cellulose fibers	Stearn, C.H.	England
1900	synthesis of caffeine	Traube, Wilhelm	Germany
1900	washing and collecting cellulose yarns	Topham, C.F.	England
1901	silicones	Kipping, Frederic Stanley	England
1902	industrial scale liquefaction of nitrogen	von Linde, Carl	Germany
1903	Discovery of triphenylmethane dyes	Baeyer, Adolf von	Germany
1904	colour-sensitized emulsions	Hoechst Dye Works	Germany
1906	production of nitric acid from nitrogen	Birkeland, Kristian/Eyde, Samuel	Norway
1906	production of nitric acid from nitrogen	Brunler, Oscar H.U.	Germany
1907	production of nitric acid by ammonia oxidation	Ostwald, Wilhelm/Bauer, Alexander	Germany
1907	Development of chemotherapy	Ehrlich, Paul/Hata, Sahachiro	Germany/Japan
1908	Raschig process to make hydroxylammonium sulfate	Raschig, Friedrich	Germany
1908	industrial process to make hydroxylamine	Raschig, Friedrich	Germany
1908	cellophane	Brandenburger, Jacques Edwin	Switzerland
1909	Bakelite phenol resin	Baekeland, Leo H.	United States
1909	welding process	Goldschmidt, Hans	Germany
1910	synthetic ammonia process	Haber, Fritz	Germany
1910	discovery of rubber-like polymers from 1,3-butadiene	Lebedev, Sergei V.	Russia

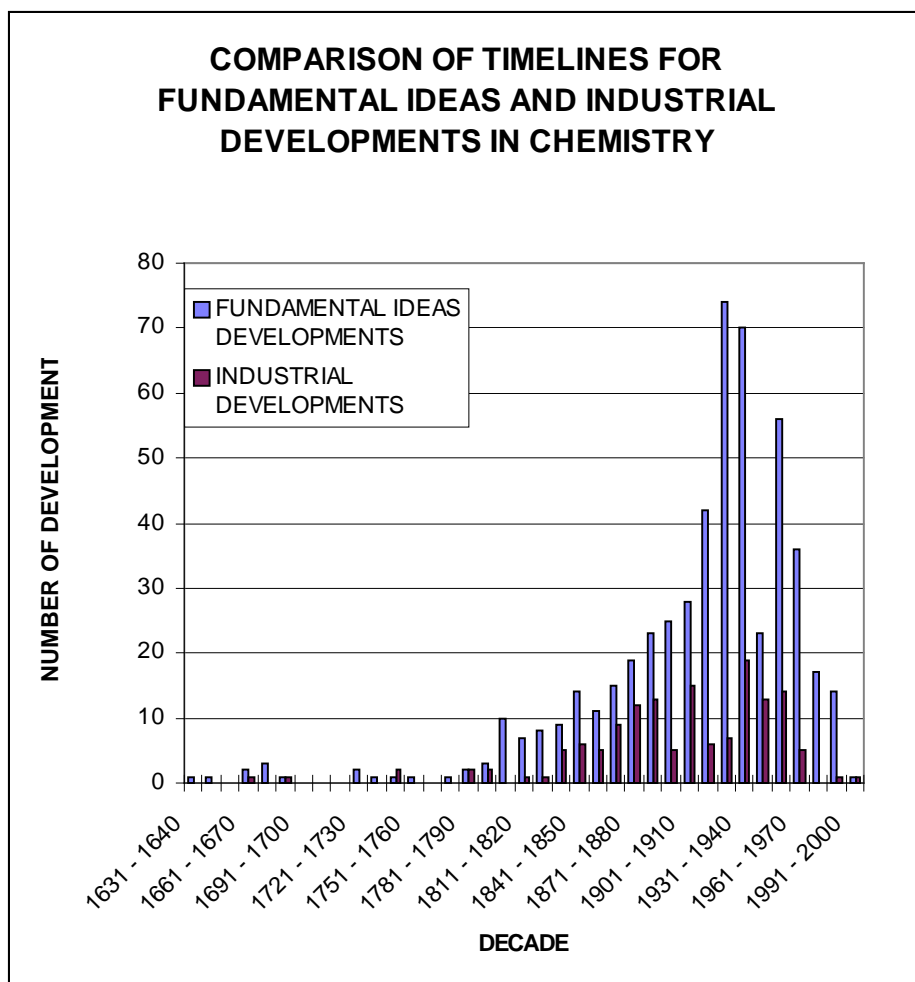
1912	synthetic rubber	Lebedev, Sergei V.	Russia
1914	polyvinylchloride	Klatte, Fritz (I.G. Farben)	Germany
1914	Wacker-Hoechst process	Wacker, Alexander	Germany
1915	Raschig-Hooker process to make phenol	Raschig, Friedrich/Hooker, Samuel	England
1917	production of acetic acid from calcium carbide		France
1920	Woolwich process		England
1923	manufacture of methanol from CO and H ₂ with iron oxide	Mittasch, Alwin (I.G. Farben)	Germany
1923	Fischer-Tropsch process	Fischer, Franz/Tropsch, Hans	Germany
1924	polyvinyl alcohol	Haehnel, W./Herrmann, W.O.	Germany
1928	production of acetone from propylene	E.I. du Pont	France/England
1928	Reppe process to make acetylenes, vinyl ethers	Reppe, Walter	Germany
1930	diisocyanates to make polyurethanes	Bayer, Otto	Germany
1930	introduction of freons as refrigerants	Midgley, Thomas	United States
1931	direct catalytic oxidation of ethylene to ethylene oxide	Lefort, T.E.	France
1932	preservative processes for canned goods	Clemmensen, Erik (Monsanto)	United States
1933	vinyl polymers	Semon, Waldo L. (B.F. Goodrich)	United States/England
1933	Lebedev process	Lebedev, Sergei V.	Russia
1933	extraction of bromine from sea water	Dow Chemical	United States
1933	Discovery of phthalocyanines as dyes	Linstead, Sir Reginald P.	England
1934	neoprene rubbers	Carothers, Wallace H. (E.I. du Pont)	United States
1935	Manufacture of D ₂ O by the hydrogen sulfide process	Geib, Karl Hermann; Spevack, Jerome S.	Germany, United States
1936	discovery of thiokol	Patrick, James Charles	United States

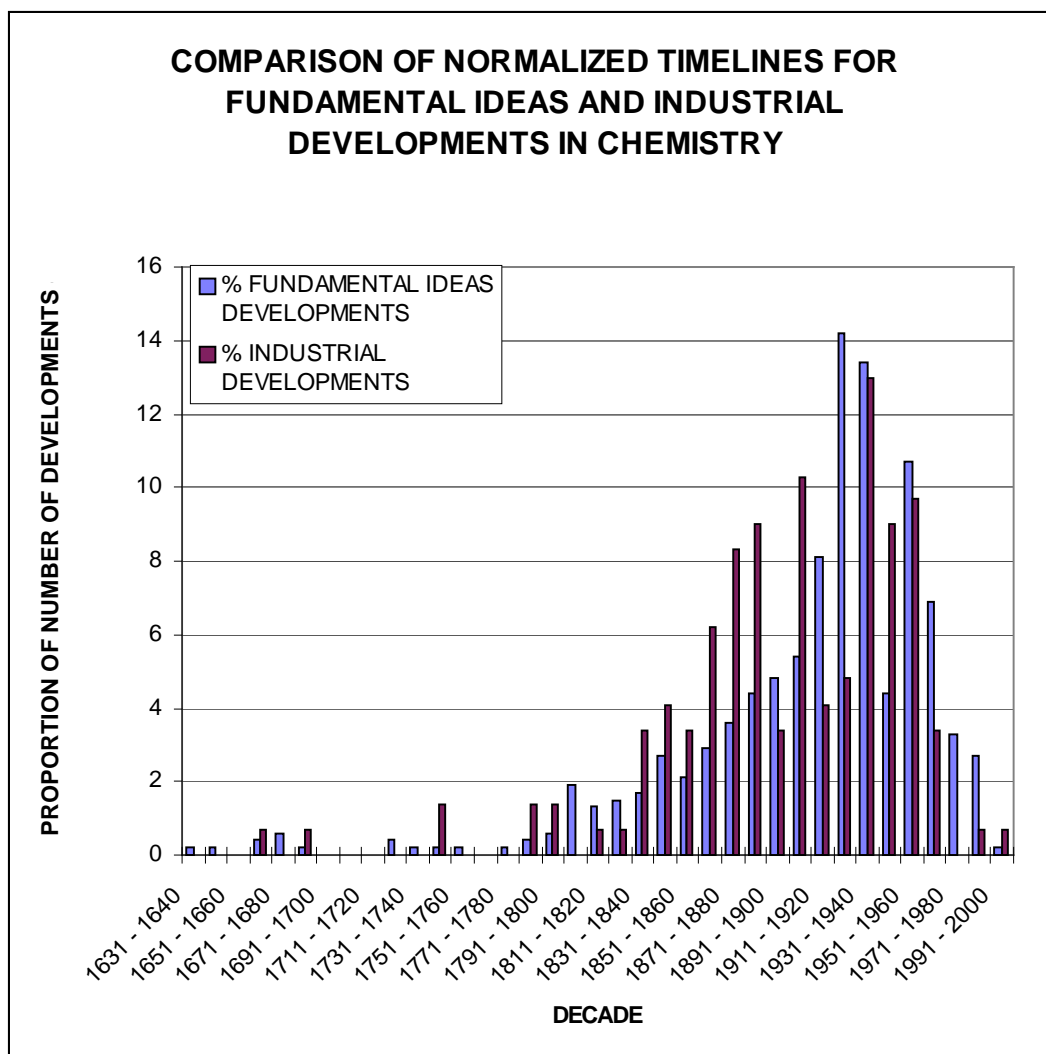
1936	methyl methacrylate resin (plexiglass)	Rohm, Otto (Rohm & Haas)	Germany/ United States
1936	sulfochlorination process	Reed, Cortes F.	United States
1937	methyl methacrylate resin (lucite)	E.I. du Pont	United States
1937	Discovery of sulphonamide drugs	Mietzsch, Fritz/Klarer, Josef	Germany
1938	nylon (polyamide fibers)	Carothers, Wallace H. (E.I. du Pont)	United States
1939	polystyrene	Stoesser, Sylvia M. (Dow Chemical)	United States
1939	melamine-formaldehyde resins	American Cyanamid	United States
1939	polyvinylchloride	Dow Chemical	United States
1939	tetraethyllead as octane enhancer and antiknocking agent in fuel	Midgley, Thomas	United States
1939	Discovery of sorbic acid as anti-microbial for use as food preservative	Mueller, E./Gooding, Chester M.	Germany/ United States
1941	first spinnable polymer by polycondensation of caprolactam	Schlack, Paul (I.G. Farben)	Germany
1941	silicone polymer	Rochow, Eugene G./Gilliam, William F.	United States
1942	unsaturated polyesters	B.F. Goodrich	England
1942	polyvinyls (saran)	Dow Chemical	United States
1943	polyethylene		
1944	synthesis of quinine	Woodward, R.B./Doering, W. von E.	United States
1944	production of acetone and phenol from cumene (Hock process)	Hock, Heinrich/La ng, S.	Germany
1944	polyacrylonitrile (orlon)	E.I. du Pont	United States
1944	use of DDT as insecticide	Mueller, Paul (Ciba Geigy)	Switzerland
1946	polytetrafluoroethylene (teflon)	Yelton, Everett B. (E.I. du Pont)	United States
1946	poly(ethylene terephthalate)	Whinfield, John	England/United States

		R./Dickson, J.T. (ICI/E.I. du Pont)	
1947	silicone resins	Dow Corning	United States
1949	polyacrylonitrile (orlon)		United States/England
1951	synthesis of cortisone	Woodward, Robert B.	United States
1951	synthesis of cholesterol	Woodward, Robert B.	United States
1951	spandex	Farbenfabri ken Bayer	Germany
1954	synthesis of lysergic acid	Woodward, Robert B.	United States
1954	synthesis of strychnine	Woodward, Robert B.	United States
1955	polyesters (dacron)		United States/England
1955	Ziegler-Natta catalysts (titanium tetrachloride- triethylaluminum)	Zieger, Karl/Natta, Giulio	Germany/Italy
1957	synthesis of penicillin	Sheehan, John C.	United States
1957	polypropylene		
1957	Discovery of thalidomide (Contergan)	Gruenenthal Chemie/Dis tillers Co. (Liverpool)	Germany/ England
1959	polyacrylonitrile (orlon)	Sohio/Stan dard Oil Co.	United States
1959	oxidation of olefins	Wacker Chemie GmbH	Germany
1960	synthesis of chlorophyll	Woodward, Robert B.	United States
1960	spandex	E.I. du Pont	United States
1962	phenoxy thermoplastic	Union Carbide	United States
1963	synthesis of colchicine	Woodward, Robert B.	United States
1965	Discovery of aspartame as sweetener	Mazur, Robert H./Schlatter , James M.	United States
1966	Discovery of ampicillin	Bristol- Myers Squibb	United States
1969	Mitsubishi process to make THF	Mitsubishi	Japan
1986	Sohio process to produce acrylonitrile	Sohio	United States
1992	Arco process to make THF	Arco Chemical Technology	United States









Genealogies of Discoverers Who Contributed to Advances in Chemical Industry

SCIENTIST	BIRTHDATE	DEATHDATE	PH.D.	UNIVERSITY	ADVISOR/MENTOR
Abel, Sir Frederick Augustus	July 17, 1827	September 6, 1902	no degree		
Armstrong, Henry E.	May 6, 1848	July 13, 1937	1869	Leipzig	Kolbe, Hermann
Audemars, George					
Baekeland, Leo Hendrik	November 14, 1863	February 23, 1944	1884	Ghent	Swarts, Theodore
Baeyer, Adolph von	October 31, 1835	August 20, 1917	1858	Berlin	Bunsen, Robert/Kekule, A.
Balsohn, M.					
Basaroff, Alexander I.	September 7, 1845	?	1868	Leipzig	

Bauer, Alexander	February 16, 1836	April 12, 1921	1866	Giessen	Schroetter, A. (Vienna Polytech.)
Baumann, Eugen	December 12, 1846	November 3, 1896	1872 (MD)	Tuebingen	Hoppe-Seyler, Felix
Bayer, Georg Wilhelm Otto	November 4, 1902	August 1, 1982	1925	Frankfurt	Braun, Julius von
Beadle, Clayton					
Bechamp, Pierre Jacques Antoine	October 16, 1816	April 15, 1908	1856 (MD)	Strasbourg	
Berthollet, Claude Louis Comte	December 9, 1748	November 6, 1822	1778 (MD)	Paris	Macquer, Pierre J./Bucquet, Jean-Baptiste M.
Bevan, Edward John	December 11, 1856	October 17, 1921	1879 (B.Sc.)	Owens College Manchester	
Birkeland, Kristian	December 13, 1867	June 15, 1917	1885 - 94	Christiania	Poincare, H. (Paris)/Hertz, H. (Bonn)
Brandenburger, Jacques Edwin	October 19, 1872	July 13, 1954	1894	Bern	
Brunler, Oscar H.U.					
Cailletet, Louis Paul	September 21, 1832	January 5, 1913			
Carothers, Wallace Hume	April 27, 1896	April 4, 1937	1924	Illinois	Adams, Roger
Chardonnet, Count Hilaire de	May 1, 1839	March 12, 1924	1861	Ecole Polytech.	
Chesebrough, Robert Augustus	January 9, 1837	September 8, 1938	no degree		
Chevreur, Michel Eugene	August 31, 1786	April 9, 1889			Vauquelin, Louis Nicolas/Fourcroy, Antoine
Claus, Carl Friedrich					
Clemmensen, Erik Christian	1876	May 19, 1941		Roy. Poly. Inst. Copenhagen	
Cross, Charles Frederick	December 11, 1855	April 15, 1935	1879 (B.Sc.)	London	Roscoe, Sir Henry Enfield
Dahl					
Despeissis, L.H.					
Dewar, Sir James	September 20, 1842	March 27, 1923	1858+	Cambridge	Playfair, Lyon
Dickson, J.T.					
Ehrlich, Paul	March 14, 1854	August 20, 1915	1878 (MD)	Leipzig	
Eyde, Samuel	October 29, 1866	June 21, 1940			
Fahlberg, Constantin	December 22, 1850	August 15, 1910	1873	Leipzig	Kolbe, Hermann (Leipzig)/Remsen, Ira (Johns Hopkins)
Fischer, Franz Joseph Emil	March 19, 1877	December 1, 1947	1899	Giessen	Elbs, Karl
Gay-Lussac, Joseph Louis	December 6, 1778	May 9, 1850	1800	Ecole Polytech.	Berthollet, Claude Louis
Geib, Karl Hermann	March 12, 1908	July 21, 1949	1931	Berlin	Haber, Fritz

Gilliam, William Farr	August 13, 1913		1939	Cornell	Laugengayer, Albert W.
Glover, John	February 1817	May 1, 1902	no degree		
Goldschmidt, Hans	January 18, 1861	May 21, 1923	1886	Heidelberg	Bunsen, Robert
Gooding, Chester M.	October 30, 1908		1934	Michigan	Gomberg, Moses
Goodrich, Benjamin Franklin	November 4, 1841	August 3, 1888	MD		
Goodyear, Charles	December 29, 1800	July 1, 1860	no degree		
Graebe, (Carl) Charles	February 24, 1841	January 19, 1927	1862	Heidelberg	Bunsen, Robert
Haber, Fritz	December 9, 1868	January 29, 1934	1891	Berlin-Charlottenberg	Liebermann, Carl
Haehnel, W.					
Hata, Sahachiro	1873	November 25, 1938	1895 (MD)	Yokohama	Kitasato, S.
Hentschel, Willibald			?	Dresden	
Hepp, Eduard	June 11, 1851	June 18, 1851	1874	Strasbourg	Baeyer, Adolf von
Herrmann, W.O.					
Heumann, Karl	September 10, 1850	August 5, 1894	1878	Heidelberg	Bunsen, Robert ?
Hinsberg, Oscar Heinrich Daniel	October 21, 1857	February 13, 1939	1882	Tuebingen	Huebner, Hans
Hock, Heinrich	April 9, 1887	?	1912	Munich	Hofmann, Karl Andreas
Hooker, Samuel Cox	April 19, 1864	October 12, 1935	1885	Munich	Bamberger, Eugen
Hyatt, John Wesley	1837	1920	no degree		
Kahlbaum, Georg W.A.	April 8, 1853	August 28, 1905	1884 (MD)	Basel	
Kahn					
Kane, Robert John	September 24, 1809	February 16, 1890	1836 (no degree)	Giessen	Liebig, Justus
Kast, Alfred	July 25, 1856	January 7, 1903	1879	Leipzig	Conheim, Julius
Kekulé von Stradonitz, Friedrich August	September 7, 1829	July 13, 1896	1852	Giessen	Will, Heinrich
Keller, Friedrich Gottlob					
Kipping, Frederic Stanley	August 16, 1863	May 1, 1949	1887	Munich	Baeyer, Adolf von
Klarer, Josef	January 10, 1898	June 21, 1953	1926	TH Munich	Fischer, Hans
Klatte, Fritz	March 28, 1880	February 11, 1934	1907	Tuebingen	
Kolbe, Adolphe Hermann	September 27, 1818	November 25, 1884	1843	Goettingen	Wohler, Friedrich/Bunsen, Robert
Lang, S.					
Lawes, Sir John Bennet	December 28, 1814	August 31, 1900	1832 (no degree)	Oxford	Gilbert, Sir Joseph Henry
Lebedev, Sergei Vasilievich	July 13, 1874	May 2, 1934	1913	St. Petersburg	

LeBlanc, Nicolas	December 6, 1742	January 16, 1806	1770s	Ecole de Chirurgie (Paris)	
Lefort, T.E.					
Liebermann, Carl Theodore	February 23, 1842	December 28, 1914	1865	Berlin	Baeyer, Adolf von Kastner, Wilhelm Gottlob
Liebig, Justus	May 12, 1803	April 18, 1873	1822	Erlangen	
Linde, Carl Paul Gottfried Ritter von	June 11, 1842	November 16, 1934	1860s	Zurich	
Linstead, Sir Reginald Patrick	August 28, 1902	September 9, 1966	1926	Imperial College London	Kon, George A.R.
Mansfield, Charles Blachford	May 8, 1819	February 26, 1855	1849 (MA)	Cambridge	Hofmann, A.W. (Roy. Coll. Chem.)
Marggraf, Andreas Sigismund	March 3, 1709	August 7, 1782	no degree	Berlin/Strassburg/Halle/Freiburg	Casp. Neumann/Spielmann/Henkel
Mazur, Robert Henry	June 15, 1924		1951	MIT	Roberts, John D.
Midgley, Thomas Jr.	May 18, 1889	November 2, 1944	1911 (Eng.)	Cornell	
Mietzsch, Fritz	May 28, 1896	November 29, 1958	1922	TH Dresden	Koenig, Walter
Miller, A.K.					Armstrong, Henry E.
Mittasch, Alwin	December 27, 1869	June 4, 1953	1901	Leipzig	Ostwald, Wilhelm
Moureu, Charles	April 19, 1863	June 13, 1929	1893	Sorbonne	
Mueller, E.					
Mueller, Paul Hermann	January 12, 1899	October 13, 1965	1925	Basel	Fichter, Carl Fritz Rudolf
Natta, Giulio	February 16, 1903	May 1, 1979	1924(chem. eng.)	Milan Poly.Inst.	
Nobel, Alfred	October 21, 1833	December 10, 1896	no degree	St. Petersburg	Zinin, Nikolai N.
Ostwald, Wilhelm	September 2, 1853	April 4, 1932	1877	Dorpat	Schmidt, Carl
Parkes, Alexander	December 29, 1813	June 29, 1890	no degree		
Patrick, Joseph Charles					
Perkin, Sir William Henry	March 12, 1838	July 14, 1907	no degree	Roy. Coll. Sci. London	Hofmann, August W.
Phillips, Peregrine					
Pictet, Raoul	April 4, 1846	July 27, 1929	1868 - 70	Paris	
Raschig, Friedrich August Fritz	June 8, 1863	February 4, 1928	1885	Berlin	
Raydt, W.					
Reed, Cortes F.					
Remsen, Ira	February 10, 1846	March 4, 1927	1870	Goettingen	Fittig, Rudolf
Reppe, Walter	July 29, 1892	July 27, 1969	1920	Munich	Meyer, Kurt H.
Rochow, Eugene George	October 4, 1909	March 21, 2002	1935	Cornell	Dennis, Louis M.

Roebuck, John	1718	July 17, 1794	1742 (MD)	Leiden	
Rohm, Otto	March 14, 1876	September 17, 1939	1901	Tuebingen	
Schlack, Paul	December 22, 1897	August 19, 1987	1920	TH Stuttgart	
Schlatter, James Myron	July 27, 1930		1954 (MA)	Indiana	
Schoenbein, Christian Friedrich	October 18, 1799	August 29, 1868	no degree	Paris	Gay-Lussac, Joseph Louis
Semon, Waldo Lonsbury	September 10, 1898	?	1923	Washington	Smith, George McPhail
Sheehan, John Clark	September 23, 1915	March 21, 1992	1941	Michigan	Bachmann, Werner E.
Smidt, Juergen					
Sobrero, Ascanio	October 12, 1812	May 26, 1888	1832 (MD)	Giessen	Liebig, Justus
Solvay, Ernest	April 16, 1838	May 26, 1922	no degree	Belgium	
Spevack, Jerome S.					
Stearn, C.H.					
Stoesser, Sylvia M.					
Swan, Sir Joseph	October 31, 1828	May 27, 1914	no degree		
Tilden, Sir William Augustus	August 15, 1842	December 11, 1926	1872	London	Hofmann, A.W./Stenhouse, John
Topham, C.F.					
Traube, Wilhelm	January 10, 1866	September 28, 1942	1888	Berlin	Hofmann, August W.
Tropsch, Hans	October 7, 1889	October 8, 1935	1913 (Eng.)	Prague	
Turpin, Eugene	1848	January 24, 1927			
Wacker, Alexander					
Whinfield, John Rex	February 16, 1901	July 6, 1966	1927 (MA)	Cambridge	
Willson, Thomas Leopold	November 14, 1860	December 21, 1915	no degree	Hamilton Collegiate Inst.	Morehead, James Turner
Woodward, Robert Burns	April 10, 1917	July 8, 1979	1937	MIT	Ashdown, Avery Allen
Wurtz, Charles Adolphe	November 26, 1817	May 12, 1884	1843 (MD)	Strasbourg	Dumas, Jean-Baptiste Andre
Yelton, Everett B.					
Zeidler, Othmar	1859	June 17, 1911			
Zieger, Karl	November 26, 1898	August 11, 1973	1920	Marburg	Auwers, Karl von

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