Chemistry Nobel Laureates

YEAR	LAUREATE	COUNTRY	CONTRIBUTION
1901	Jacobus Henricus van 't Hoff	Netherlands	Discovery of laws of chemical dynamics Osmotic pressure in solutions
1902	Hermann Emil Fischer	Prussia	Sugar and purine syntheses
1903	Svante August Arrhenius	Sweden	Electrolytic theory of dissociation
1904	Sir William Ramsay	Scotland	Discovery of inert gaseous elements in air
1905	Johann F. Wilhelm A von Baeyer	Prussia	Organic dyes & hydroaromatic compounds
1906	Henri Moissan	France	Isolation of fluorine & electric furnace
1907	Eduard Buchner	Germany	Cell free fermentation
1908	Ernest Rutherford	New Zealand	Chemistry of radioactive substances
1909	Wilhelm Ostwald	Latvia	Chemical equilibria & rates of reaction
1910	Otto Wallach	Germany	Research on Alicyclic compounds
1911	Marie Curie Sklodowska	Poland	Discovery of radium and polonium
1912	Victor Grignard Paul Sabatier	France France	Discovery of Grignard reagent Hydrogenating organic compounds
1913	Alfred Werner	France	Linkage of atoms in molecules
1914	Theodore William Richards	USA	Determination of atomic weighs
1915	Richard Martin Willstatter	Germany	Research on plant pigments (chlorophyll)
1916	**Not Awarded**		
1917			
1918	Fritz Haber	Poland	Synthesis of ammonia from its elements
1919	**Not Awarded**		
1920	Walther Hermann Nernst	Poland	Thermochemistry
1921	Frederick Soddy	UK	Chemistry of radioactive substances
1922	Francis William Aston	UK	Discovery of isotopes of non-radioactive elements
1923	Fritz Pregl	Slovenia	Micro analysis of organic substances
1924	**Not Awarded**		
1925	Richard Adolf Zsigmondy	Austria	Modern colloid chemistry
1926	Theodor Svedberg	Sweden	Disperse systems
1927	Heinrich Otto Wieland	Germany	Constitution of bile acids
1928	Adolf Otto Reinhold Windaus	Germany	Constitution of sterols and their connection with the vitamins

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1929	Arthur Harden Hans K A S von Euler Chelpin	UK Germany	Fermentation of sugar and fermentative enzymes
1930	Hans Fischer	Germany	Constitution of haemin and chlorophyll
1931	Carl Bosch Friedrich Bergius	Germany Poland	Invention and development of chemical high pressure methods
1932	Irving Langmuir	USA	Surface chemistry
1933	**Not Awarded**		
1934	Harold Clayton Urey	USA	Discovery of heavy hydrogen
1935	Frederic Joliot Irene Joliot Curie	France France	Synthesis of new radioactive elements
1936	Petrus J Wilhelmus Debye	Netherlands	Diffraction of X rays & electrons in gases
1937	Walter Norman Haworth Paul Karrer	UK Russia	Carbohydrates and vitamin C Carotenoids, flavins & vitamins A, B2
1938	Richard Kuhn	Austria	Carotenoids and vitamins
1939	Adolf F Johann Butenandt Leopold Ruzicka	Germany Croatia	Sex hormones Polymethylenes and higher terpenes
1940 1941 1942	**Not Awarded**		
1943	George de Hevesy	Hungary	Isotopes in the study of chemical processes
1944	Otto Hahn	Germany	Fission of heavy nuclei
1945	Artturi Ilmari Virtanen	Finland	Fodder preservation method
1946	James Batcheller Summer John Howard Northrop Wendell Meredith Stanley	USA USA USA	Crystallization of enzymes Preparation of enzymes and virus proteins in a pure form
1947	Sir Robert Robinson	UK	Investigations of plant products (alkaloids)
1948	Arne Wilhelm Kaurin Tiselius	Sweden	Electrophoresis and adsorption analysis
1949	William Francis Giauque	Canada	Chemical thermodynamics
1950	Otto Paul Hermann Diels Kurt Alder	Germany Poland	Discovery and development of diene synthesis
1951	Edwin Mattison Mc Millan Glenn Theodore Seaborg	USA USA	Chemistry of transuranium elements
1952	Archer John Porter Martin Richard L Millington Synge	UK UK	Invention of partition chromatography

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1953	Herman Staudinger	Germany	Macromolecular chemistry
1954	Linus Carl Pauling	USA	Nature of chemical bond
1955	Vincent du Vigneaud	USA	Synthesis of a polypeptide hormone
1956	Sir Cyril Norman Hinshelwood Nikolay Nikolaevich Semenov	UK Russia	Mechanism of chemical reactions
1957	Lord Alexander R Todd	Scotland	Nucleotides & nucleotide co-enzymes
1958	Frederick Sanger	UK	Structure of proteins (insulin)
1959	Jaroslav Heyrovsky	Czech	Polarographic methods of analysis
1960	Willard Frank Libby	USA	Use of C – 14 in archaeology, geology, geophysics and other branches
1961	Melvin Calvin	USA	CO_2 assimilation in plants
1962	Max Ferdinand Perutz John Cowdery Kendrew	Austria UK	Structures of globular proteins
1963	Karl Ziegler Giulio Natta	Germany Italy	Chemistry of high polymers
1964	Dorothy crowfoot Hodgkin	Egypt	Structures of important biochemical substances
1965	Robert Burns Woodward	USA	Organic synthesis
1966	Robert S Mulliken	USA	Molecular orbital method
1967	Manfred Eigen Ronald George W Norrish George Porter	Germany UK UK	Study of extremely fast chemical reactions
1968	Lars Onsager	Norway	Thermodynamics of irreversible processes
1969	Derek H R Barton Odd Hassel	UK Norway	Concept of conformation and its application in chemistry
1970	Luis F Leloir	France	Discovery of sugar nucleotides
1971	Gerhard Herzberg	Germany	Electronic structure, geometry of molecules (free radicals)
1972	Christian B Anfinsen Stanford Moore William H Stein	USA USA USA	Work on ribonuclease Connection between chemical structure and catalytic activity of the active center of the ribonuclease molecule
1973	Ernst Otto Fischer Geoffrey Wilkinson	Germany UK	Chemistry of organometallic compounds
1974	Paul J Flory	USA	Physical chemistry of the macromolecules

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1975	John Warcup Cornforth Vladimir Prelog	Australia Bosnia	Stereochemistry of enzyme catalysed reactions Stereochemistry of organic molecules
1976	William N Lipscomb	USA	Structure of boranes illuminating problems of chemical bonding
1977	Ilya Prigogine	Russia	Non-equilibrium thermodynamics
1978	Peter D Mitchell	UK	Biological energy transfer
1979	Herbert C Brown Georg Witting	UK Germany	Organic synthesis
1980	Paul Berg Walter Gilbert Frederick Sanger	USA USA UK	Biochemistry of nucleic acids (recombinant DNA) Determination of base sequences in nucleic acids
1981	Kenichi Fukui Roland Hoffmann	Japan Ukraine	Theories concerning the course of chemical reactions
1982	Aaron Klug	Lithuania	Crystallographic electron microscopy
1983	Henry Taube	Canada	Mechanism of electron transfer reactions
1984	Robert Bruce Merrifield	USA	Methodology for chemical synthesis on a solid matrix
1985	Herbert A Hauptman Jerome Karle	USA USA	Development of direct methods for determination of crystal structures
1986	Dudley R Herschbach Yuan T Lee John C Polanyi	USA Taiwan Germany	Dynamics of chemical elementary processes
1987	Donald J Cram Jean Marie Lehn Charles J Pedersen	USA France South Korea	Development and use of molecules with structure specific interactions of high selectivity
1988	Johann Deisenhofer Robert Huber Hartmut Michel	Germany Germany Germany	Determination of 3D structure of a photosynthetic reaction center
1989	Sidney Altman Thomas R Cech	Canada USA	Discovery of catalytic properties of RNA
1990	Elian James Corey	USA	Development of theory and methodology of organic synthesis
1991	Richard A Marcus	Switzerland	Contribution to theory of electron transfer reactions in chemical systems

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1992	Rudolph A Marcus	Canada	Theory of electron transfer reactions in chemical systems
1993	Kary B Mullis Michael Smith	USA UK	Invention of the polymerase chain reaction (PCR) Establishment of oligonucleotide based; site directed mutagenesis
1994	George A Olah	Hungary	Contribution to carbocation chemistry
1995	Paul J Crutzen Mario J Molina F Sherwood Rowland	Netherlands Mexico USA	Atmospheric chemistry (formation and decomposition of ozone)
1996	Robert F Curl Jr Sir Harold W Kroto Richard E Smalley	USA UK USA	Discovery of fullerenes
1997	Paul D Boyer John E Walker	USA UK	Elucidation of enzymatic mechanism underlying the synthesis of adenosine triphosphate (ATP)
1998	Walter Kohn John A Pople	Austria UK	Development of density functional theory Development of computational methods in quantum chemistry
1999	Ahmed H Zewail	Egypt	Studies of transition states of chemical reactions using femtosecond spectroscopy
2000	Alan J Heeger Alan G MacDiarmid Hideki Shirakawa	USA New Zealand Japan	Discovery and development of conductive polymers
2001	William S Knowles Ryoji Noyori K Barry Sharpless	USA Japan USA	Chirally catalysed hydrogenation reactions Chirally catalysed oxidation reactions
2002	John B Fenn Koichi Tanaka Kurt Wuthrich	USA Japan Switzerland	Development of soft desorption ionisation methods for mass spectrometric analyses of biological macromolecules Development of nuclear magnetic resonance spectroscopy for determining 3D structure of biological macromolecules in solution
2003	Peter Agre Roderick MacKinnon	USA USA	Discovery of water channels in cell membranes Structural and mechanistic studies of ion channels

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2004	Aaron Ciechanover Avram Hershko Irwin Rose	Israel Hungary USA	Discovery of ubiquitin-mediated protein degradation
2005	Yves Chauvin Robert H Grubbs Richard R Schrock	Belgium USA USA	Development of metathesis method in organic synthesis
2006	Roger D Kornberg	USA	Studies of molecular basis of eukaryotic transcription
2007	Gerhard Ertl	Germany	Studies of chemical processes on solid surfaces
2008	Osamu Shimomura Martin Chalfie Roger Y Tsien	Japan USA USA	Discovery and development of green fluorescent protein (GFP)
2009	Venkatraman Ramakrishnan Thomas A Steitz Ada E Yonath	India USA Israel	Studies of structure and function of the ribosome
2010	Richard F Heck Ei-ichi Negishi Akira Suzuki	USA China Japan	Palladium catalysed cross coupling in organic synthesis
2011	Dan Shechtman	Israel	Discovery of quasicrystals
2012	Robert J Lefkowitz Brian K Kobilka	USA USA	Studies of G protein coupled receptors
2013	Martin Karplus Michael Levitt Arieh Warshel	Austria South Africa Israel	Development of multiscale models for complex chemical systems
2014	Eric Betzig Stefan W Hell William E Moerner	USA Romania USA	Development of super-resolved fluorescence microscopy
2015	Tomas Lindahl Paul Modrich Aziz Sancar	Sweden USA Turkey	Mechanistic studies of DNA repair
2016	Jean Pierre Sauvage Sir J Fraser Stoddart Bernard L Feringa	France UK Netherlands	Design and synthesis of molecular machines

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2017	Jacques Dubochet Joachim Frank Richard Henderson	Switzerland Germany Scotland	Development of cryo-electron microscopy for high resolution structure determination of biomolecules in solution
2018	Frances H Arnold George P Smith Sir Gregory P Winter	USA USA UK	Directed evolution of enzymes Phage display of peptides and antibodies
2019	John B Goodenough M Stanley Whittingham Akira Yoshino	Germany UK Japan	Development of lithium-ion batteries
2020	Emmanuelle Charpentier Jennifer A Doudna	France USA	Development of method for genome editing