= International Union of Pure and Applied Chemistry =

The International Union of Pure and Applied Chemistry (IUPAC , / ?a?ju?pæk / or / ?ju?pæk /) is an international federation of National Adhering Organizations that represents chemists in individual countries . It is a member of the International Council for Science (ICSU) . The international headquarters of IUPAC is in Zürich , Switzerland . The administrative office , known as the " IUPAC Secretariat " , is in Research Triangle Park , North Carolina , United States . This administrative office is headed by IUPAC 's executive director , currently Lynn Soby .

IUPAC was established in 1919 as the successor of the International Congress of Applied Chemistry for the advancement of chemistry . Its members , the National Adhering Organizations , can be national chemistry societies , national academies of sciences , or other bodies representing chemists . There are fifty @-@ four National Adhering Organizations and three Associate National Adhering Organizations . IUPAC 's Inter @-@ divisional Committee on Nomenclature and Symbols (IUPAC nomenclature) is the recognized world authority in developing standards for the naming of the chemical elements and compounds . Since its creation , IUPAC has been run by many different committees with different responsibilities . These committees run different projects which include standardizing nomenclature , finding ways to bring chemistry to the world , and publishing works .

IUPAC is best known for its works standardizing nomenclature in chemistry and other fields of science , but IUPAC has publications in many fields including chemistry , biology and physics . Some important work IUPAC has done in these fields includes standardizing nucleotide base sequence code names ; publishing books for environmental scientists , chemists , and physicists ; and improving education in science . IUPAC is also known for standardizing the atomic weights of the elements through one of its oldest standing committees , the Commission on Isotopic Abundances and Atomic Weights .

= = Creation and history = =

The need for an international standard for chemistry was first addressed in 1860 by a committee headed by German scientist Friedrich August Kekulé von Stradonitz . This committee was the first international conference to create an international naming system for organic compounds . The ideas that were formulated in that conference evolved into the official IUPAC nomenclature of organic chemistry . IUPAC stands as a legacy of this meeting , making it one of the most important historical international collaborations of chemistry societies . Since this time , IUPAC has been the official organization held with the responsibility of updating and maintaining official organic nomenclature . IUPAC as such was established in 1919 . One notable country excluded from this early IUPAC is Germany . Germany 's exclusion was a result of prejudice towards Germans by the Allied powers after World War I. Germany was finally admitted into IUPAC during 1929 . However , Nazi Germany was removed from IUPAC during World War II .

During World War II , IUPAC was affiliated with the Allied powers , but had little involvement during the war effort itself . After the war , East and West Germany were eventually readmitted to IUPAC . Since World War II , IUPAC has been focused on standardizing nomenclature and methods in science without interruption .

= = Committees and governance = =

IUPAC is governed by several committees that all have different responsibilities . The committees are as follows : Bureau , CHEMRAWN (Chem Research Applied to World Needs) Committee , Committee on Chemistry Education , Committee on Chemistry and Industry , Committee on Printed and Electronic Publications , Evaluation Committee , Executive Committee , Finance Committee , Interdivisional Committee on Terminology , Nomenclature and Symbols , Project Committee , and Pure and Applied Chemistry Editorial Advisory Board . Each committee is made up of members of different National Adhering Organizations from different countries .

The steering committee hierarchy for IUPAC is as follows :

All committees have an allotted budget to which they must adhere .
Any committee may start a project .
If a project 's spending becomes too much for a committee to continue funding , it must take the issue to the Project Committee .
The project committee either increases the budget or decides on an external funding plan .
The Bureau and Executive Committee oversee operations of the other committees

= = Nomenclature = =

IUPAC committee has a long history of officially naming organic and inorganic compounds . IUPAC nomenclature is developed so that any compound can be named under one set of standardized rules to avoid duplicate names . The first publication , which is information from the International Congress of Applied Chemistry , on IUPAC nomenclature of organic compounds , can be found from the early 20th century in A Guide to IUPAC Nomenclature of Organic Compounds (1900) .

= = = Organic nomenclature = = =

IUPAC organic nomenclature has three basic parts : the substituents , carbon chain length and chemical ending . The substituents are any functional groups attached to the main carbon chain . The main carbon chain is the longest possible continuous chain . The chemical ending denotes what type of molecule it is . For example , the ending ane denotes a single bonded carbon chain , as in " hexane " (C
6H
14) .
Another example of IUPAC organic nomenclature is cyclohexanol :
The substituent name for a ring compound is cyclo .
The indication (substituent name) for a six carbon chain is hex .
The chemical ending for a single bonded carbon chain is ane
The chemical ending for an alcohol is ol
The two chemical endings are combined for an ending of anol indicating a single bonded carbon chain with an alcohol attached to it .

= = = Inorganic nomenclature = = =

Basic IUPAC inorganic nomenclature has two main parts : the cation and the anion . The cation is the name for the positively charged ion and the anion is the name for the negatively charged ion .
An example of IUPAC nomenclature of inorganic chemistry is potassium chlorate ($KClO_3$) :
" Potassium " is the cation name .
" Chlorate " is the anion name .

= = Amino acid and nucleotide base codes = =

IUPAC also has a system for giving codes to identify amino acids and nucleotide bases . IUPAC needed a coding system that represented long sequences of amino acids . This would allow for these sequences to be compared to try to find homologies . These codes can consist of either a one letter code or a three letter code .
These codes make it easier and shorter to write down the amino acid sequences that make up proteins . The nucleotide bases are made up of purines (adenine and guanine) and pyrimidines (cytosine and thymine or uracil) . These nucleotide bases make up DNA and RNA . These nucleotide base codes make the genome of an organism much smaller and easier to read .
The codes for amino acids (24 amino acids and three special codes) are :

= = Publications = =

= = = Non @-@ series books = = =

= = = Experimental Thermodynamics book series = = =

The Experimental Thermodynamics books series covers many topics in the fields of thermodynamics .

= = = Series of books on analytical and physical chemistry of environmental systems = = =

= = = Colored cover book and website series (nomenclature) = = =

IUPAC color code their books in order to make each publication distinguishable .

= = International Year of Chemistry = =

IUPAC and UNESCO were the lead organizations coordinating events for the International Year of Chemistry , which took place in 2011 . The International Year of Chemistry was originally proposed by IUPAC at the general assembly in Turin , Italy . This motion was adopted by UNESCO at a meeting in 2008 . The main objectives of the International Year of Chemistry were to increase public appreciation of chemistry and gain more interest in the world of chemistry . This event is also being held to encourage young people to get involved and contribute to chemistry . A further reason for this event being held is to honour how chemistry has made improvements to everyone 's way of life .