



Introduction to CAS

a division of the
American Chemical Society

For more than 100 years, Chemical Abstracts Service (CAS) has had an interesting history, beginning as an idea by one man to give credit to the genius of American scientists and developing into the trendsetter of being the information solutions provider that CAS is today. CAS exists to facilitate research in chemistry and its tangential sciences by continually striving to find useful ways of presenting the researcher with the information it provides. This has meant both utilizing current technology and creating new technology to meet the increasing customer needs.



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www.cas.org

PURPOSE

CAS is widely acknowledged as the world's authority for chemical information. CAS is the only organization in the world whose objective is to find, collect and organize all publicly disclosed chemical substance information. A team of scientists—speaking 50 languages among them—curates and controls the quality of its databases using state-of-the-art, proprietary technology systems developed by CAS. They



review and intellectually analyze published research from thousands of major scientific journals and patent documents from 63 patent

authorities, fully disclosing the new and novel science within. These databases are recognized as the most comprehensive and authoritative by chemical and pharmaceutical companies, universities, government organizations and patent offices around the world. By combining these databases with advanced search and analysis technologies primarily through SciFinder® and STN®, CAS delivers the most current, complete, secure and interlinked digital information environment for scientific discovery.

HISTORY

In 1895, Arthur Noyes, who was of a distinguished family of American chemists, founded the *Review of American Chemical Research* at the Massachusetts



Institute of Technology. Noyes felt that U.S. chemists were not being recognized adequately for their accomplishments. As German chemists seemed to be getting all the attention, Noyes decided to publish summaries or abstracts of American chemical research papers.

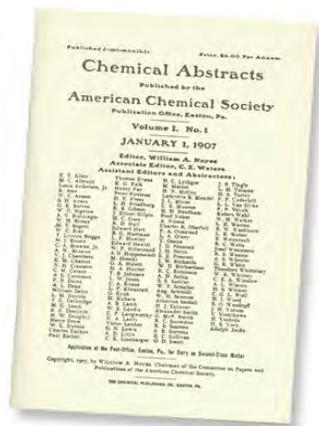
In 1897 the *Review of American Chemical Research* became a part of another publication, the *Journal of the American Chemical Society*.



William A. Noyes, Sr., a cousin of Arthur Noyes, was editor of the *Journal of the American Chemical Society*. He argued strongly that simply publishing these abstracts as a

supplement to the journal was not enough. He felt that American Chemical Society (ACS) should publish a more comprehensive

abstracting journal in the chemical field. In 1906, ACS authorized the publication of *Chemical Abstracts™* (CA). It began publication in 1907 with William Noyes as the first editor and



contained fewer than 12,000 abstracts. CA was first published at the U.S. Bureau of Standards and then at the University of Illinois in Urbana when the CAS offices moved there.

Noyes was succeeded as editor of CA by Austin Patterson in 1909. By invitation of William



McPherson, head of the chemistry department at The Ohio State University (OSU), the CA editorial office was moved to Columbus, Ohio, and the OSU campus so that Patterson could be closer

to the Patterson home in Xenia, Ohio. Patterson remained editor until 1914 when poor health forced him to retire. He was followed briefly as editor by John Miller.

The next 40 years saw many challenges, but under the direction of Evan J. Crane, CA's growth continued as it became the standard by which other scientific indexing services were measured.



Among other things, Crane emphasized the importance of indexing literature rather than simply abstracting it.

In 1928, the office of CAS moved from its single-classroom, four-person office on the OSU campus to the new McPherson Chemistry Building. By the mid-1950s, the number of staff had grown



to 100 and a separate three-story building was built to house the CA operations. By 1960, it was necessary to add a fourth floor to the CAS building to continue to house the staff which had now grown to 300. This growth was beginning to strain both the building and the university's resources.

In 1962, ACS purchased the 50 acres upon which the CAS offices now reside. In 1965 CAS moved into its own building on this land. A second



adjoining building was added in 1973. A third building, housing the data center, was dedicated in 2000.

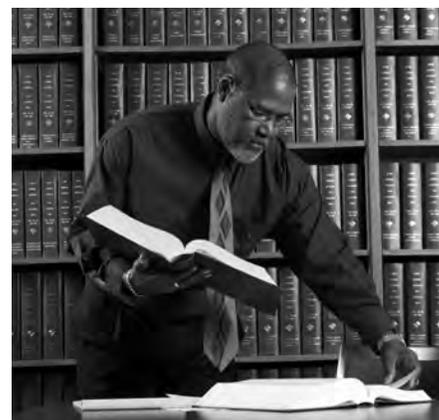
Until 1956, *CA* production expenses were funded in part from dues paid by the individual members of the ACS. In 1956, CAS was established as a self-supporting division of the Society. All CAS operations are now supported through fees charged for its products and services. CAS “profits” are partially returned to the ACS, supporting its general programs and partially re-invested in research and development at CAS.

Upon Crane’s retirement in 1958 Dale B. Baker became the CAS director until his retirement in 1986. It was Baker’s far-sighted view of CAS’s potential that led to expansion, modernization and the forging of international alliances with other information organizations.



HOW *CA* WAS COMPILED

Since its inception, *CA* served scientists with timely, comprehensive and accurate access to the world’s chemical literature. *CA* provided concise summaries and extensive indexes of the major disclosures in recently published scientific documents to help researchers determine if they needed the original document. Processes, substances, laboratory equipment, bibliographic information and more were included in the coverage found in *CA*.

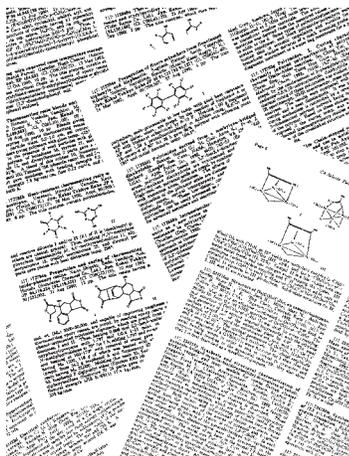


In the beginning, CA was basically an abstracting service, with the abstracts provided by volunteers worldwide and the editing and indexing done



by a limited full-time staff. Today, the majority of abstracts are prepared by CAS editorial staff in Columbus. This shift away from volunteer abstractors to in-house staff occurred in the 1960s, which resulted from the need for greater timeliness in abstracting and indexing and the introduction of computer processing of the data. Today, the CAS document analysis is a highly integrated system of human intellectual effort assisted by advanced information technology.

CAS staff monitors thousands of scientific journals every year, including the results of chemical research reported in journal articles, patents, symposia, conference



proceedings, dissertations, technical reports and new books in chemistry. The original documents are published around the world in any of 50 languages. Approximately 1.5 million documents are selected for abstracting/indexing each year. Each department of CAS serves a special function in making this data available to the customer, from data-entry operators and editors across the line to the software developers, print shop, marketers, billing department and account representatives.

ELECTRONIC DATA FITS INTO THE LARGER PICTURE

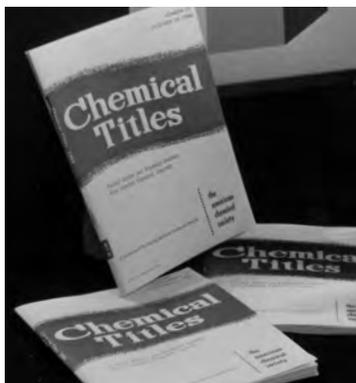
Central to the development and growth of CAS has been the evolution from the production of a printed service to the generation of computer-readable databases from which a variety of printed, microform and electronic services



could be readily derived. The computer-based production system developed by CAS in the late 1960s and early 1970s supported the growth and development of new services that were primarily

intended to provide CAS with the ability to cope with the increasing volume of the chemical literature. The following chronology shows how this computer sensitivity affected the growth of CAS.

In 1961, the world's first periodical to be organized, indexed and composed almost totally



by computer, *Chemical Titles*, was introduced by CAS. It was also the first periodical to use the keyword-in-context indexing technique.

Perhaps the most far-reaching development to come out of CAS's work on mechanized information handling, the CAS Chemical Registry System, was installed in 1965. The CAS Chemical Registry System is a computer-based system that



uniquely identifies chemical substances on the basis of their molecular structures. Beginning in 1965, the structures and names for all chemical substances

indexed for *CA* were recorded and each unique substance was assigned, by computer, an identifying number, the CAS Registry Number®.

Beginning in the late 1960s, CAS started to license some of its computer-readable files to a number of organizations for the purpose of their providing information services based on local batch searching of the files. In the early 1970s remote online access was extended to some of these files.

In 1980, CAS introduced its own online service, *CAS Online*. The initial offering provided online substructure searching of the CAS REGISTRYSM database. This online service continued to grow



and expand to include the full *CA* bibliographic, abstract and index information.

A significant accomplishment of CAS research and development efforts during the 1980s was the development of Messenger. Messenger was designed to permit online searching in a wide variety of technical databases and became the foundation of STN International®, an online



network today offering access to more than 140

international scientific and technical databases.

STN is an online search service offered jointly by the American Chemical Society and FIZ Karlsruhe. It links together the CAS computers in Columbus, Ohio, and FIZ Karlsruhe computers in Karlsruhe, Germany. This new STN business opportunity was made available to librarians and specialists worldwide and opened a whole new world of information searching. In 1988, STN Express® software was developed to assist with STN

database searching.

STN Express®

CAS has provided a wide range of printed, microform and computer-readable chemical information services through the years. While CA was the principal printed service, CAS also produced others, such as *Chemical Industry Notes* (CIN®), *CA Selects™*, *CAS BioTech Updates*, *Chemical Titles* (which listed just the titles of articles from core chemical journals) and the *CAS Source Index* (CASSISM), which contains

bibliographic information for more than 98,000 scientific and technical serial and non-serial publications. Today, CASSI is offered to customers as a free Web-based product.

CAS offers access to many databases, including CASM (references), CAplusSM (references), CAS REGISTRY (chemical substances), CASREACT® (reactions), MARPAT® (Markush structures), CIN, CHEMLIST® (regulated chemicals) and CHEMCATS® (chemical supplier information),

CAS DATABASES *Chemistry + a Whole Lot More!*

which are available for searching in CAS solutions.

In 1983, the CA Search Service was introduced to provide searches of the CAS databases upon request for those who did not use STN or other CAS products. In 2003, the CA Search Service evolved into what is known today as Science IP®. Science IP is the CAS information service that provides fast, accurate and



comprehensive searches of the world's scientific and technical literature. Science IP can assist an organization with a variety of customized searching and competitive analysis capabilities in the field of scientific intellectual property

protection, from an exhaustive search to a focused report. The Science IP research team consists of highly-trained scientists who are also expert patent searchers and search more than just CAS databases.

In October 1994, CAS announced SciFinder, a new generation research tool to assist scientists and researchers worldwide with access to the CAS



databases. SciFinder, originally

a client-server application which worked on Macintosh or Windows desktop computer systems, placed information ranging from chemical structures to chemical-related literature at the fingertips of scientists who have little or no online search expertise. SciFinder went online in 1995. In 1997, a version of SciFinder designed for use at colleges and universities was introduced.



In 2008, a Web version of SciFinder was released, providing users with enhanced search capabilities

and instant access to CAS database content from anywhere in the world.

CAS has also introduced several Web-based products that expanded access to chemical information. STN Easy® is a Web-accessible



interface to STN, featuring point-and-click access

to selected STN databases and an easy-to-use interface. STN® on the WebSM offers access to all the STN databases and uses



the traditional command line interface similar to what is used in STN.

In September 1997, full-text capabilities were introduced as a Web-based free service that provided links from abstracts in CAS databases to electronic full text of journals as well as U.S. and European patents. Now known as CAS Full Text Options, users of SciFinder, STN and other electronic CAS products



can seamlessly link to articles from more than 7,400 electronic journals from nearly 360 participating publishers.

CAS introduced CAS Mobile in 2005 for real-time interaction with CAS information on wireless handheld devices. CAS continued to

develop electronic services to make scientific information more accessible and useful. In 2005, STN® AnaVist™ was introduced by CAS and FIZ



Karlsruhe to enable the analysis and

visualization of search results from a variety of perspectives. STN® Viewer™ was rolled out as a



Web-based workflow productivity

tool for patent information users in 2007 and will be replaced by PatentPak™ in STN.

For more than 100 years, CAS produced CA, the world's premier chemistry information resource. During that time, CA evolved beyond its original print format to become a part of all CAS

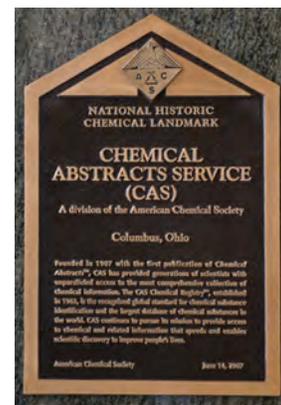


electronic services, meeting the changing information needs of

chemists, information professionals and other research scientists. With the overwhelming adoption of CAS electronic products, it was no longer feasible for CAS to produce CA and other printed products as of January 1, 2010. However, CA continues to be accessed in CAS's electronic

products such as CA web edition, SciFinder and STN. Electronic products from CAS, including STN and SciFinder, not only provide the content found in CA but also provide additional substance, reaction, chemical regulatory and supplier catalog information. STN and SciFinder provide the most comprehensive access to the world's chemical and related research.

CAS celebrated its 100-year anniversary in 2007 and was recognized by the ACS as a National Historic Chemical



Landmark. People asked what CAS's secret to success is and Robert J. Massie, CAS president from 1992-2013, replied: "I'd have to say it's the kind of people we hire. We've been blessed for 100 years with an unusual mix of people who have been drawn to our global mission as stewards of unique scientific assets serving the global scientific community. The company focused on quality and seriousness of purpose, which is rolled into our DNA here. CAS continues to expand its global reach with more than 50% of CAS's revenues coming from outside the U.S. The market has changed with China, India and Asia, but the continuity remains English as the preferred language of science."

Starting in 2010, CAS created a program dedicated to providing Ph.D. students and postdocs from around the world an opportunity to shape the future of chemical information. Annually, CAS opens up applications for the SciFinder Future Leaders in Chemistry program to Ph.D. students or postdoctoral researchers in chemistry or



related science. By sharing their immediate research needs and insight

into what may be on the horizon, participants help CAS continue to innovate long term.

In 2012, CAS and FIZ Karlsruhe announced Version One of the new STN platform, which was the first major milestone in a multi-year initiative to create the next generation of STN. Additional database content, features and functionality continue to be added to the new STN platform which will eventually replace the STN Messenger software.

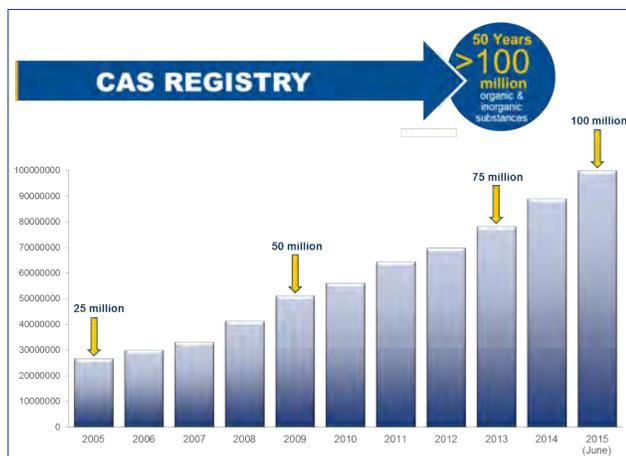


CAS continues to introduce new information solutions in 2015:

- NCI™ Global is a Web-based  solution for anyone who needs regulatory information about commercially available chemicals. NCI Global is a more timely, higher value replacement for National Chemical Inventories™ (NCI) on CD-ROM.
- PatentPak™ is  a robust, patent workflow solution designed to radically reduce the time spent acquiring and searching through multiple patents to find vital chemistry. PatentPak is currently available as an add-on to SciFinder.
- The CHEMCATS  Information Supplier Program allows suppliers to list their chemical catalogs in SciFinder as a way to reach more scientists. This also benefits researchers, who can quickly and efficiently order supplies they need in the lab from reputable sources.

Scientific and chemical information has exploded through the years. A great example of this relates to the growth of CAS REGISTRY:

- the 25 millionth substance was registered in 2005
- the 50 millionth substance in 2009
- the 75 millionth substance in 2013
- In 2015, CAS REGISTRY celebrated its 50th anniversary with the registration of the 100 millionth chemical substance. CAS REGISTRY is the world's largest database of unique chemical substances. On average, CAS has registered one substance every 2.5 minutes over the past 50 years.



CAS began as a chemical information service over 100 years ago. Today, CAS is global in the primary scientific sources it covers, the content repositories it creates, the audience it serves and the reach of its products, solutions and services. The information landscape has been rapidly shifting in recent years with the onset of increased end user searching. CAS is evolving toward the future, developing new information solutions for scientists and patent searchers to enable discoveries and advance research around the world.

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CAS:



Scientists serving science.



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