

CHEMISTRY ON STAMPS

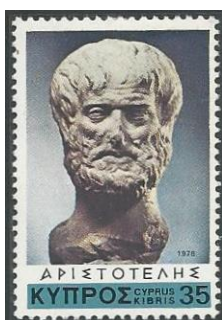
... by Gianluigi Soldati

Chemistry – the study of matter and the changes matter undergoes – plays an important part in many fields including agriculture, engineering, medicine, nutrition, petroleum and pharmacy. Chemical research has led to the development of numerous medicines, nylon and other synthetic fibers, plant fertilizers, petroleum derivatives, synthetic rubber and plastics. The DuPont Chemical slogan – “*Better Things for Better Living through Chemistry*” – sums it up best.

So it is not surprising that there are many stamp issues related to Chemists and Chemistry – in fact, the ATA chemistry checklist has over 3000 entries! Here are some examples of Chemistry on Stamps, also known as chemophilately.

Theories of Chemistry

Greek philosophers were among the earliest to study the structure of matter. Aristotle (384-322 BC), seen here on Cyprus #505, is often credited with originating the theory of four elements – Earth, Air, Fire, and Water. However, Empedocles (495-430 BC), among others, proposed that theory almost a century earlier.



[NOTE: Scott catalog numbering used for all stamps.]

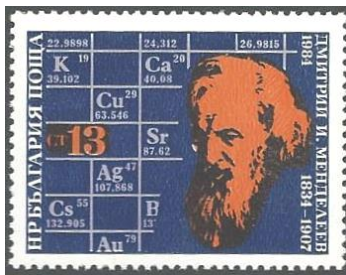


Antoine Lavoisier (1743-94), shown here on France #464, published the first modern list of the 29 elements (and their properties) known at that time. However, it took another 80 years to organize the elements.

Russian chemist Dmitri Mendeleev (1834-1907)

formulated the Periodic Law and created the Periodic Table of chemical elements in 1869 that became the foundation of modern chemistry. The scientist is seen below on Bulgaria #2947.

Mendeleev arranged the elements in order of increasing atomic weights and in columns by chemical properties. His work is deemed one of the most important contributions to chemistry, and he is considered one of the fathers of modern chemistry.



Element Names

More than 100 elements have now been identified and assigned a chemical symbol. This consists of one or two letters from the common or original Latin name of the element such as (H) for hydrogen, (C) for Carbon, (N) for Nitrogen, (Ca) for Calcium, (Fe) for Ferrum (the Latin word for Iron), and (Hg) for Mercury (the Latin word Hydrargyrum).

Other elements are named after the mythological gods such as Palladium (Pd) for Pallas and Thorium (Th) for the Scandinavian god of war, Thor.

Elements are also named for famous scientists such as Curium (Cm) for Marie Curie (shown at right on Poland #1518); Einsteinium (Es) for Einstein; and Fermium (Fm) for Fermi.

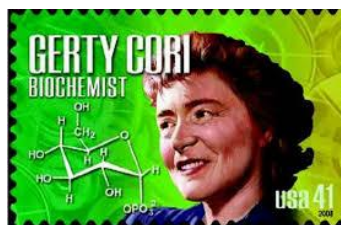


Sometimes names were given by the geographical location related to their discovery such as Americium (Am) for America; Francium (Fr) for France; Germanium (Ge) for Germany; Hafnium (Hf) for the old name for Copenhagen; and Polonium (Po) for Poland.

Chemistry Branches

Chemistry is generally divided into six groups: Biochemistry, Inorganic, Organic, Physical, Analytical and Medicinal.

Biochemistry is the study of chemistry applied to plants and animals. All the reactions that occur in your body are governed by chemistry – from the conversion of food into energy to the replication of your genetic material (DNA). Japan #927 (above) shows a bacterial protein model and the Gerty Cori stamp (US #4224) shows the (incorrect) structure of the energy storage sugar, glucose.

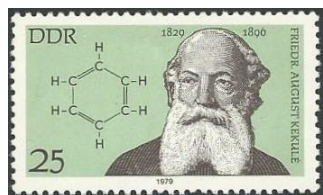


Inorganic Chemistry is the study of all elements, metals, and minerals that do not contain the element Carbon (C). The stamp at the right, Mexico #1173, shows the symbols of some inorganic substances exported from Mexico including Silver (Ag), Lead (Pb), Zinc (Zn), Calcium Fluoride (CaF₂) and Sodium Chloride (NaCl) that we know as common table salt.



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Organic Chemistry involves carbon and carbon compounds. The element Carbon is found in nature as coal. Examples of carbon compounds include plant and animal tissue, sugar, carbohydrates, proteins, plastics, petroleum products and rubber.



Identifying the molecular structure of organic compounds revolutionized organic chemistry. The structure of benzene, a component of gasoline and other petroleum products, was discovered by Friedrich Kekule (1820-1896) shown above on GDR #1997.

The structure of aniline, another organic compound, was developed by Nicolai Zinin (1812-1880) depicted on Russia #2618. Aniline is used in the production of inks and many products useful in the drug and pharmaceutical industry. Aniline inks were also used in printing postage stamps. Zinin was the teacher of a young chemist named Alfred Nobel.



Physical Chemistry applies physics to the study of chemistry. For example, it is used to predict how much energy is produced by a chemical reaction. Several stamps were issued by Sweden showing atomic models developed by European physicists such as Werner Heisenberg. His model is shown on Sweden's #1429 stamp issue.



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Analytical Chemistry is the study of the properties of chemicals, such as what elements are present in a sample. One of the methods analytical chemists use is **spectrometry** or spectroscopy to study how a chemical product disperses. Christmas Island #97 shows a spectrometer used for those tests.



Scientists also use **chromatography** to separate a chemical sample into its constituent components. This is useful in determining the purity of a sample. GB #808 shows a chromatographic analysis (chromatogram) where each colored stain represents a constituent component present in the sample tested.



Medicinal Chemistry is the discipline involved in the design of new medicines and the improvement of existing ones. Many stamps have been issued to honor famous medicinal chemists. Monaco #2444 shows Daniel Bovet (1907-1992) who developed anti-histamines used to treat allergic reactions.

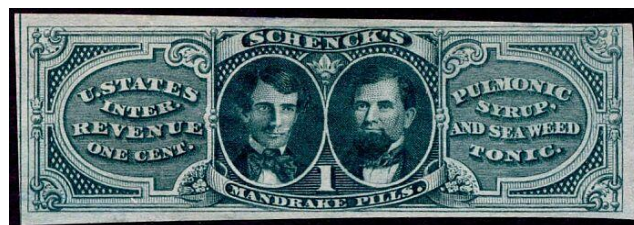


Hungary #2699 was issued to commemorate Sir Alexander Fleming (1881-1955) and the discovery of Penicillin for which he was awarded the 1945 Nobel Prize in Medicine.

The United States has produced a number of stamps that depict chemists and chemistry. An unusual group is the **Private Die Proprietary Medicine** stamps (RS# Series) which depict little known chemists. The example at the right (US #RS295) shows chemist Charles Marchand who is famous for developing a stable form of hydrogen peroxide for use in hair coloring.



We finish up with a beautiful example of an engraved Proprietary Medicine issue – US #RS212.



Joseph H. Schenck introduced his Mandrake Pills in 1836 to help people ". . . keep their insides clean, as nature intended . . ." The stamp design also advertises Pulmonic Syrup (a treatment for consumption) and Sea-Weed Tonic (for dyspepsia).

This article touched on selected topics and fields of chemistry and was written to demonstrate the various facets of chemistry and the many contributions made by chemistry to improve our standard of living.

For a chemist like me, collecting chemistry on stamps is an ideal way of combining my occupational knowledge with my enjoyment of stamp collecting.

Editor's Note: This article is a rewrite of a previous piece on the same topic published in Topical Times in 2005 (Volume 56, pages 26-31).