

Louis Henry

Born: 26 December 1834 (Marche-en-Famenne))

Died: 9 March 1913 (Leuven)

Henry studies natural philosophy at the Université Catholique de Louvain from 1851 till 1855, where unfortunately the teaching of science is held in low esteem, let alone the attention given to laboratory work and research. After spending a year at the Université de Liège, he brushes up his schooling and familiarizes himself with research and practical chemistry at Giessen (Germany) under Heinrich Will (1812-1890), the successor to Justus von Liebig (1803-1873).

In 1858 Henry is appointed as professor of mineralogy and geology in Leuven and from 1866 on he holds the chair of chemistry. In 1866 he publishes “Précis de Chimie Générale Élémentaire”. In this course he emphasises the structure of the carbon compounds. Let us keep in mind that this period heralds the research on coal-tar and synthetic dyes, leading to a new approach to carbon chemistry.

Henry is a splendid teacher, prepares his lessons thoroughly and enounces his ideas in a clear language. During many years he has to struggle to obtain a decent laboratory, does research “just for the fun of it” (that’s what his superiors pretend) and even pays his assistant from his personal income. He even receives a complaint by the dean of the university about his high gas bill!

His struggle ends with the establishment of the Arenberg laboratories in 1909.

Louis Henry as an academic reformer.

In 1869 Henry and a few other professors manage to put an end to the rather undemanding way a doctorate is obtained and shortly after the following rules are introduced:

1. The report of 1869 submits the creation of three kinds of doctorates: mathematics, physical chemistry (subdivided into physics and chemistry) and natural sciences (part inorganic chemistry with mineralogy and geology, and part organic chemistry with botany and zoology). The attention is drawn to the importance of experimental work and the necessity to turn out a thorough final dissertation (not judged necessary till then). Those ideas are the basis of a law of 1890 and a law of 1929 introducing the degree of master.

2. The report insists on the reorganization of science-training, with emphasis on the creation of laboratories for all students to train them to observe and experiment in view of obtaining their doctorate. The studies are divided into the degree of ‘candidate’ (2 years of general study; the

title is actually called 'bachelor'), followed by the degree of 'licentiate' (specialization, nowadays corresponding to 'master') and 'doctor' (PhD)

Scientific work

Henry's 435 publications mainly deal with organic chemistry, especially (the *synthesis* of) hydrocarbons. He manages the synthesis of *dipropargyl* (a linear and unsaturated hydrocarbon, isomer of benzene) and studies its thermodynamic properties making him conclude that "*affinity is heat*". About this subject he already had vented his ideas to Marcellin Berthelot (1827-1907) in Paris and August Kekulé (1829-1896) in Bonn.

His practical research and experimental work resulted in the following rules:

- *the functional solidarity*, i.e. the mutual influence of different functional groups in the same molecule and even belonging to the same carbon atom. He presents this thesis during a congress in Blois in 1883, but it has kept his mind busy since 1861.
- *polymerization and molecular association* (1878) following a study of metaloxides. He foretells that water has the formula $(\text{H}_2\text{O})_n$ later confirmed by François-Marie de Raoult (1830-1901) and William Ramsay (1852-1916);
- *the rule concerning addition reactions* (1874) anticipates that (in a carbon-carbon double bond) the most negative radical adds to the carbon atom with the least hydrogen atoms. Some years earlier (1870) Vladimir Markovnikov (1837-1904) generalizes this rule by stating that in unsymmetrical unsaturated carbon compound, the addition of hydrogen occurs at the carbon atom having already the most hydrogen atoms. There was a slight difference of opinion between the two chemists when applied to the reaction between propene and hypochloric acid, leading to two isomers. But the addition rule remains valid.
- the equivalence of the four valencies of carbon (1886), proven by an ingenious continuing of substitutions in methane.

Henry is honoured in 1900 to which contribute the later Nobel prizewinners J.H. Van't Hoff (1852-1911), A. Von Baeyer (1835-1917) and W. Ostwald (1853-1932), S. Arrhenius (1859-1927) and many of his pupils from all over the world.

Louis Henry dies in Leuven in 1913 after a long illness.