

BRUYLANTS Pierre

Born: July 9, 1885 – Leuven

Died: March 9, 1950 – Winksele

Pierre is the son of Gustave Bruylants (1850-1925), who becomes from 1878 on professor of physiological and pharmaceutical chemistry, toxicology and food analysis at the University of Leuven. In the pharmacy of his grandfather Pierre-Joseph (1811-1901), Gustave becomes familiar with chemical instruments and chemicals.

Predestined for science

Before obtaining his doctorate in 1908 under the mentorship of Paul Henry (1866-1917), Pierre Bruylants uses his father's equipment to compare the spectrum of aldehydes and ketones. The subject of his doctorate concerns the study of cyclic trimethylene molecules, followed by a number of papers about the synthesis of trimethylenebromide (1,3-dibromopropane). With a scholarship and a motorbike (his father's contribution) he studies electrochemistry at the Polytechnicum of Aachen under the tutorship of the authority of electrochemical analysis Alexander Classen (1843-1934) and publishes his findings about the electrolytic quantitative analysis of cobalt compounds. In the spring of 1909, at the laboratory of Philippe A. Guye (1862-1922) in Geneva, he tackles the problems of the gravimetric analysis of gases. Due to the precision of his task, he builds his own glasswork and delights in the manual dexterity needed for it. Applying Bruylants' technique, William Ramsey (1852-1916) discovers the noble gases. Pierre also publishes a book about the new concepts of the theory of chemical valence and pays attention to the principle of mesomerism.

A prolific professorship

In 1911, Pierre is recalled to Leuven as successor to Charles Blas (1839-1919) and till 1914 he teaches physical chemistry. When Paul Henry is regularly absent for reasons of ill health, Pierre also lectures the general chemistry and becomes the holder of the chair when the university reopens its doors after the First World War in 1918. In the meantime he already has written his four-volume "*Traité élémentaire de chimie*", applying the principles of F.W. Ostwald (1853-1932), A.F. Holleman (1859-1953) and T. Swarts (1839-1911): introduce the general laws during the study of the elements where and when the logic requires it. His mentor P. Guye prefaces the book, which will become the cornerstone for the formation of many scientists. In 1913 he becomes an associate professor and shortly after full professor. His teaching is methodical, practical, clear, severe and precise. Whenever possible, he enlivens his lectures with experiments.

A restless researcher

His research covers a large number of subjects: the vapor pressure curves of sulfur dioxide at low temperatures (with W. Mund 1892-1956), the precise determination of the atomic weight of selenium starting from seleniumhydride (with J. Dondeyne and P. Putzeys 1897-1983) and of tellurium starting from telluriumhydride (with G. De Smet and J. Michielsen)

He is the author of over 200 papers on organic chemistry, a criterion of his true passion. Contiguous to his doctoral thesis he studies a number of substitutes of cyclopropane compared to their linear isomers. This leads to a study of the nitriles (mainly unsaturated): α -chlorinated and α -methylated nitriles, the thermochemical study of butenenitriles, the synthesis of crotonnitrile (2-butenitrile, $\text{CH}_3\text{-CH=CH-CN}$) and epoxynitrile. From 1920 on he studies the reactivity of the

CN-radical and the interaction with the double-bond in the cis- or trans-isomers of the molecule. He develops through analysis the location of the double-bond and a technique to determine the site through the rate of bromination. Nitriles play a dominant role in the synthesis of other organic molecules (amides, carboxylic acids, amines, ketones) and allow the C-chain lengthening or changing.

Hydrogen atoms in α -position relative to the nitrile group behave as a Lewis acid and are easily removed through organometallic compounds. When the French chemist Victor Grignard (1871-1935), who together with Paul Sabatier (1854-1941) was awarded the Nobel Prize for Chemistry in 1912, linked his name to the organomagnesium compounds (Grignard reagent), it is almost self-evident that he invited P. Bruylants to write the chapter about the nitriles and who at the same time also contributes a study of carbylamines (isonitriles, R-NC) and amidines.

Bruylants also shows an interest in amides and ketones: the refractometry of saturated nitriles and n-methylketones, the spectroscopy and crystallography of α -oxiamides (with J. Verhulst 1906-1987) and the recently synthesised amides (with A. Castille- 1898-1973).

He also studies radioactivity applied to a number of physico-chemical techniques and contributes (with J.C. Jungers 1908-1993) to a study of the kinetics of catalysts.

He contributes to the discovery of the geometric molecule structures, later on confirmed through Raman spectroscopy (M. de Hemptinne 1902-1986). His interests result in research on synthetic polymers and their industrial applications. When a chair for macromolecular chemistry is established, Bruylants' ex-student Georges Smets (1915-1991) is selected its director.

In the meantime, Bruylants cooperates closely with the company Gevaert (Mortsel) where a number of his ex-students are already studying the chemistry of dyes (A. Van Dormael 1915-1993). Under his leadership roughly 80 new dyes are synthesized to be incorporated into emulsions for color-photography. In 1943 Bruylants is appointed chairman and supervisor of Gevaerts research laboratory. Prior to obtaining this function, he needed the approval of the rector of the university, Mgr. Van Waeyenbergh (1891-1971).

Like his father Gustave, Pierre has a traditional bond with the Tiense Suikerraffinaderij.

A great status in and outside Belgium

In 1928 Bruylants is awarded the Decennial Prize for Chemistry and Physics. In 1923 he becomes corresponding member, followed in 1935 by his full membership and concluding in 1942 as the president of the Royal Academy of Belgium, Section Sciences. In 1929 he is already president of the Société Chimique de Belgique and honorary member of the Société Chimique de France. In 1937 he is nominated member of the National Council for Chemistry and the Conseil de Chimie Solvay. He becomes one of the first members of the third commission of the Nationaal Fonds voor Wetenschappelijk Onderzoek (National Foundation for Scientific Research)

In 1913, Pierre Bruylants marries Berthe Huyberechts. They have 7 children. Their daughter Paule dies at the early age of 16, and their son Pierre, an outstanding chemist in a metallurgic factory dies young (1921-1962).

On the occasion of his 35-years of his professorate in 1948, he is solemnly fêted in the presence of friends and ex-students. It is a last tribute to the "Boss".

Paul Balduck – April 2009 / Transl. Yves De Cock – March 2010

