ISSN:2249-5347
IJSID
International Journal of Science Innovations and Discoveries
An International peer Review Journal for Science

Nobel Prize in Chemistry 1903

Svante August Arrhenius

The Nobel Prize in Chemistry 1903 was awarded to Svante Arrhenius *"in recognition of the extraordinary services he has rendered to the advancement of chemistry by his electrolytic theory of dissociation"*.

RESEARCH INFORMATION:

One of the most prominent features of natural science research in our day is the reciprocal action characterizing During the first year of the last century Volta made the first electric pile. By studying the chemical actions of the electric current thus obtained Davy in Britain and Berzelius and Hisinger in Sweden arrived at the conclusion that the relationship between electrical and chemical phenomena was one of cause and effect. On the basis of this idea Berzelius established his well-known electrochemical theory, which reigned supreme until the middle of the century; however, new discoveries showed that this theory would not stand up to examination, and chemical phenomena ceased to be explained as being due to electricity. It was generally accepted that chemical changes of matter were due to a certain affinity, though the origin of this affinity was absolutely unknown. Then came the heyday of thermochemistry, when it was believed that the

explanation of the transformation of chemical energy during chemical reactions lay in the heat phenomena occurring during chemical processes.

Around 1880 Svante Arrhenius - then studying for a doctorate in science - arrived, as a result of his researches into the movement of electric current through solutions, at a new explanation of the causes of chemical phenomena, i.e. he attributed them to electrical charges contained in the constituents of reacting substances. Electricity was thus introduced as a decisive factor into the theory of chemistry, in other words the basic notion of the theory of Berzelius had come back into favour, although in a greatly modified form.

In the time of Berzelius this notion rested on a qualitative basis only, whereas Arrhenius's theory determined it quantitatively, thus allowing it to be treated mathematically. In his doctor's thesis, twenty years ago, Arrhenius had deduced from this principle all known laws governing chemical changes, but despite this the new theory was very little understood. It so conflicted with current ideas as to disprove them. According to this theory, for instance, common salt, sodium chloride, when dissolved in water splits up to a varying extent, in other words it is *dissociated* into its constituent parts which are diametrically opposed but charged with electricity, i.e. into *ions of chlorine* and of *sodium*, the only chemically effective substances in a solution of common salt. The theory also claimed that when an acid and a base react upon one another, water is the primary product and salt the secondary, and not reversely, as was then generally believed. Ideas so contrary to those current at that time could not be accepted immediately. A struggle lasting more than ten years and an enormous number of new experiments were required before the new theory was accepted by everyone. During this long battle over Arrhenius's theory of dissociation tremendous advances were made in chemistry and ever closer links were established between chemistry and physics - to the great benefit of both sciences.

One of the most important consequences of Arrhenius's theory was the completion of the great generalizations for which the first Nobel Prize for Chemistry was awarded to Van't Hoff. Without the support of Arrhenius's theory that of Van't Hoff would never have gained general recognition. The names of Arrhenius and Van't Hoff will go down in history

of chemistry as marking the modern period of this science and it is for this reason that the Academy, despite the fact that the experimental basis of the theory of dissociation belongs to physics, did not hesitate to award the Nobel Prize for Chemistry to Arrhenius.

The Academy of Sciences counts itself fortunate in being able to award the Nobel Prize for Chemistry this year to the compatriot of Berzelius who rehabilitated the fundamental notion of his theory, and its task is made even more pleasant by the fact that its choice is supported by the most outstanding scientific authorities of our day.

Doctor. The world of science already recognizes the importance and value of your theory, but its lustre will continue to increase in the days to come, as you yourself and others use it to advance the science of chemistry. Physical research has contributed to your discovery and this fact throws new light on the relationship - more sensed than proved - between the different natural sciences, the common objective of which is to solve the riddles of life.

Success spurs us on to new endeavours - a fact realized by the generous Maecenas, whose name is now linked with your own. May your future work bear ever more abundant fruit and, when champions of the spirit and of learning advance along the trail that you have blazed, may your name be remembered in the proud words: *Ille fecit*.

For more details please visit:

http://www.nobelprize.org/nobel_prizes/chemistry/laureates/1903/press.html