Mendeleev/Periodic Table Essay, Research Paper

Dimitri Mendeleev & The Periodic Table

Derived by Dimitri Mendeleev, the periodic table may be one of the most informational tables contained in chemistry. By leaving gaps in the columns and rows, Mendeleev was allowing for the discovery of undiscovered elements of that time. From the properties of the elements surrounding these gaps, Mendeleev was able to predict the properties of these undiscovered elements. Finally, when other scientists discovered the tools of the periodic table, Mendeleev’s achievements were recognized. Mendeleev was a versatile genius who was interested in many various fields of study, including pure and applied science.

Dimitri Ivanovich Mendeleev. 1834-1907, was a Russian chemist, known for his development of the periodic table of elements. This is a table created to arrange the elements by their atomic number. Mendeleev was born in Tobolsk, Siberia. He studied chemistry at the University of Saint Petersburg. Until 1859, when he was sent to learn at the University of Heidelberg, he became aquatinted with the Italian chemist Stanislao Cannizzaro, whose views on atomic weight changed his thinking. Mendeleev came back to Saint Petersburg and became a professor of chemistry at the Technological Institute in 1863. He became professor of general chemistry at the University of Saint Petersburg in 1866. Mendeleev was a renowned teacher, and, because no good textbook in chemistry was available, he wrote the two-volume “Principles of Chemistry” which became a classic. During the writing of his book, Mendeleev tried to organize the elements according to their chemical properties and atomic mass. In 1869 he published his first of what became known as the periodic table, a table created to arrange the elements by their atomic number. In 1871 he published a better version of the periodic table, in which he left empty spaces for elements that were undiscovered. Mendeleev s chart and theories gained acceptance when three predicted elements gallium, germanium, and scandium were discovered and fit the places he had set aside. Mendeleev’s experiment also included the study of the chemical theory of solution”, the “thermal expansion of liquids , and the “nature of petroleum . In 1887 he went on a solo balloon flight to study a solar eclipse, being the first to ever witness a solar eclipse from the air. In 1893 he became director of the Bureau of Weights and Measures in Saint Petersburg and held this position until his death. From the periodic table and its arrangement, one is able to obtain a wealth of information of an element from the organization of it. The elements found within these boundaries are described as non-metals and metals. Metals have properties such as solids at room temperature, conduct heat well, high reflectivity, and shiny metallic luster, malleable and ductile, photoelectric effect, and thermonic effect Nonmetals exhibit qualities such as, gases, liquids, or solids at room temperature, poor conductors of heat, insulators (poor conductors of heat), do not have a high reflectivity or a shiny metallic appearance, brittle and fracture easily under stress. These large groups of metals and nonmetals can be broken up into smaller groups including the Alkali Metals, the Alkaline Earth metals, and Groups III to VIII metals. Transitional elements are also a large portion of the periodic table. These elements differ greatly from the characteristics of the metals and nonmetals. They exhibit characteristics such as, characteristics of metals, have several ocidation states, form many complex ions, majority of their compounds are colored, and compounds have magnetic properties. The transitional elements are each very unique because they display various qualities that differ within the period and group. They also have different crystal structure and acid-base properties. One very interesting characteristic of transitional elements is the variance in the oxidation states. Each element has multiple oxidation states depending on the element in which the transitional element is combined with. Almost all the electron configurations contain from 1 to 10d electrons in addition to the noble gas configuration.