

Research Essay Sample

Silicon

Silicon is a chemical element under number 14, bearing the marking Si. Being one of the most widely-spread metalloids, it is the 8th most abundant element in the Universe; although in nature it almost never exists in pure form, most often being encountered as a component element of silica and other chemical compounds. In the Earth's crust it is, however, second only to oxygen in abundance, making up to 30% of its total mass. Silicon was first discovered by Antoine Lavoisier in 1787, although the honor of identifying it is generally ascribed to Berzelius, who did it forty years later.

Being one of the most widely spread elements in existence, silicon throughout the history of human civilization played a very important role in architecture and construction, because it served as a component of many building materials, such as glass, concrete and stone. The most dramatic impact of silicon on the human existence and the world's economics was caused, however, only in the 20th century, when it became widely used in the production of semiconductors and transistors that have later evolved into computer chips, laying a foundation for the whole information industry that is one of the most characteristic features of modern times. The usage of silicon in this industry, however, requires the silicon of much greater purity, than anything that can be found in nature. Thus, various methods of producing pure silicon had to be developed, generally being subdivided into melting it by various means and producing it chemically.

Among other applications of silicon there are metal alloys, generally used in automobile industry and the production of silicones, silicon-carbon and silicon-oxygen chemical compounds, the most striking feature of which is their ability to serve as media between organic and non-organic matter, creating very flexible and resistant to outside influence materials that find a very wide application: waterproof solutions, chemical waxes, contact lenses, breast implants and so on.

Silicon is similar to carbon in many ways; in fact, it is considered to be the only other chemical element that can serve as the basis for life, although it isn't that good at creating connections with other elements. However, this theory is still plausible, though not proved.

As we may see, silicon plays tremendous role in our lives, although we may generally not think about it. If the Earth did not contain this much of this element, our existence could have been completely different.