

Example of sodium essay

[Environment](#), [Disaster](#)



With close to 2.8% of the earth's crust consisting of sodium in compounds, Sodium is by no doubt one of the most abundant elements on earth. The element has an atomic mass of about 22.98 amu and belongs to period 3 Group 1 (1A) (between Lithium and potassium) hence has an atomic number of 11, a valance of 1 and an oxidation state of +1. The Latin name for the symbol of Sodium is Natrium hence the symbol Na while the "Sodium" in Latin is referred to as Sodanum. Additionally, even though the element has 14 isotopes, the only stable isotope of sodium has a mass number of 23 and has an abundance of close to 100%. This is because the other isotopes with mass numbers ranging from 19 to 31 are excessively radioactive with remarkably short half-lives. As one of the most reactive elements in the earth, sodium oxidizes readily in the air, is wax-like, silver colored and soft in nature and has a density of 0.9674 g/cm³ hence can float on water while reacting with it producing hydrogen gas. Assertively, the element has a remarkably low melting of about 97°C and a boiling point of 883°C.

Notably, Sodium does not have a rich history even though scientist had started to carry some experiments with it as early as 1700. Henri-Luis Duhamel du Monceau is believed to have been the first scientist to study the properties of minerals that exhibited alkaline characteristics. However, the first metallic form of Sodium was extracted by Sir Humphry Davy through electrolysis of sodium hydroxide; the method has remained the most common means of extracting sodium from its ores. Sodium is used in vapor lamps, formation of Sodium nitrate that is commonly used as a fertilizer, table salt (NaCl) and baking powder among other several uses.

Friedrich Wöhler (1800-1882)

The word urea is an extraordinarily common with in chemistry and biology and whenever the word is mentioned, the name Friedrich Wöhler comes into mind. Friedrich Wöhler is the first man in the world to synthesize urea as well as other several chemical compounds. Born in 1800 in Escherheim to Auguste Wöhler, a wealthy farmer, and Katherina Schröder, a professor of philosophy, Friedrich Wöhler is regarded as one the greatest (and perchance the last) all-rounder chemists of all time who was widely known for his exemplary skills in carrying out experiments prompting people refer to him as a laboratory chemist rather than a theoretical chemist. He spent much of his childhood days collecting minerals and at eighteen he became overly interested in understanding the chemistry of minerals.

He attended the Frankfurt Gymnasium from 1814 but later transferred to Marburg in anticipation that he would find a medical course in Marburg. On realizing that there was no medical course at Marburg, he opted to transfer to Heidelberg where he met Leopold Gmelin, a German chemist and son of Johann Friedrich Gmelin who is celebrated for being part of the group of scientists who discovered potassium ferricyanide; Leopold Gmelin is instrumental in Wöhler life as he profoundly encouraged him with his laboratory works and even published joint papers with him.

The achievements of Wöhler include; being the first person to synthesize urea, being a co-discoverer of elements like silicon and beryllium, and synthesis of calcium carbide. Reportedly, between 1821 and 1880, there are more than three hundred papers in Wöhler's name, over 23 papers they

partnered with Liebig and another close to 20 papers that he coauthored with other random researchers.

Applications of Nuclear Energy

Nuclear energy is widely known to be utilitarian in producing energy and for destructive purposes such the making of nuclear bombs. However, there are a plethora of other uses of nuclear energy that are majorly positive. Firstly, several nuclear isotopes find wide usage in agricultural production.

Admittedly, we are currently living in a world where livestock productivity has been considerably hampered with the advent of incessant and ever growing prevalence of livestock diseases. This situation is exacerbated further by the fact that traditional methods of disease diagnosis have proved to lack sensitivity and specificity that are much needed in order to accurately diagnose livestock diseases in a timely manner. Nonetheless, on a positive note, nuclear energy is steadily being applied in the timely detection of livestock diseases. The detections make use of radioisotopes and can also be use id detection of leaking pipes, determination of age as well as tracing of pollutants in the human body. Most importantly, such radioisotopes currently are used to treat cancers in what is famously known as radio therapy.

On the same note, gamma rays, which can be categorized as nuclear energy, is steady becoming a pertinent sterilizer for medical equipment used for surgical purposes, killing germs in wounds, and sterilizing gloves.

Hydrochloric Acid

Hydrochloric acid (chemical formula: HCl) was discovered in 800AD by Jabir Ibn Hayyan through mixing common salt with oil of vitriol. Known to

European alchemists “ as spirit of salt” or acidum salis, hydrochloric acid was later prepared by Joseph Priestly in 1772 before Humphry Davy proved its chemical composition in 1818. This acid that is also commonly known as Muriatic acid is known to be one of the strongest and one of the most hazardous acids in the world that should be handled with uttermost care due to its corrosive nature.

Apparently, hydrogen chloride, the most common compound used in the synthesis of hydrochloric acid, occur naturally in gases emitted during volcanic activities, occur naturally in mineral deposits such as sylvite and halite and can also exists naturally in the digestive systems of mammals. Interestingly, the concentration of hydrochloric acid found in the intestines of mammals is strong enough to corrode metals, however, does not corrode the digestive track because of the track is normally protected by a mucus lining. The acid has a molecular mass of about 36 amu. The acid is can be prepared by absorbing hydrogen chloride gas in water or by burning chlorine and hydrogen together,

Presently, hydrochloric acid is used industrially in the production of organic compounds such a vinyl chloride (used in manufacturing PVC) and bisphenol A (BPA) (which is a significant component in hard plastics). Moreover, the acid is used in the treatment of oil wells, cleaning of metals, pickling of steel prior to galvanization, ore reduction, production of chlorides, neutralizing alkalis as well as chemical cleaning and processing, in the building industry for cleaning bricks, and cleaning of household products. Other uses of Hydrochloric acid include; production of corn syrups.

Oxidation and Reduction and their uses

While Oxidation in its basic form implies to the addition of oxygen to a compound or an element during a chemical reaction, reduction implies to the removal of one or more oxygen atoms from a compound in a reaction. In some instances, chemical reactions involve sharing of electrons, gaining of electrons or losing of electron. When viewed from this perspective oxidation and reduction normally take different definitions whereby oxidation is delimited as the process of losing an electron while reduction is the gaining of an electron.

There are several chemical processes involving oxidation that are overly useful to human. For instance, combustion is ideally an oxidation process that involves the burning of fuels in the presence of oxygen produce energy. During combustion, the fuel is oxidized by oxygen thereby realizing energy. Photosynthesis is yet another oxidation process that is of outstanding significance to humans. Confessedly, photosynthesis is the primary source food on earth. During photosynthesis, green plants take in carbon dioxide converting it into sugars in a process which can be later metabolized to produce energy.

Reduction, on the other hand, is equally of import as it finds wide usage in laundry and medical cares. Bleaches are some of the most prominent oxidizing agents used laundry. Bleaches work by breaking the chemical bonds of one of the most important components in colors changing it to a compound that has no color or has remarkable reflection capabilities. In such a reaction, the bleach gets reduced while the component that makes up

color gets oxidized. Just like bleaches, antiseptics work on the principle of reduction whereby it gets oxidized while the foods substance in wounds gets reduced. Normally, for bacteria to grow there must be oxygen for metabolism hence when oxygen is absent, the bacteria is usually unable to grow.