

Sodium chloride an important compound



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Topic Sodium Chloride - An Important Compound Background, properties and products formed from Sodium Chloride Presented by :

Dated : / / 2008

Every cell of our bodies contains salt - an adult human body contains about 250 grams to maintain the normal volume of blood and digest food. This salt is halite, chemically known as Sodium Chloride and commonly known as rock salt is one of the few very important reagents in the chemical industry today. The salt is found in the form of evaporative deposits, after it's crystallization out of the brine lakes through evaporation with time, in places like Salt Lake City, Utah, Germany, Mullhouse in France and Searles Lake California in the U. S. Moreover, it is also found in the ancient bedrock all over the planet in the form of thick layers in places where water bodies used to exist in the form of salt lakes and seas, all of which have evaporated millions of years ago.

About 4, 700 years ago, the Chinese Png-tzao-kan-mu, one of the earliest known writings, recorded more than 40 types of salt. Ancient civilizations have used salt as one of the vital supplements in diet, with archaeological evidence of Iron Age salt-making largely based upon the discovery of remnants of coarse pottery vessels and supporting pillars recognized as being connected with salt-making and known as briquettage. In Britain, lead salt pans were used by the Romans at Middlewich, Nantwich and Northwich and excavations at Middlewich and Nantwich have revealed extensive salt-making settlements. Moreover, writings on salt no doubt also existed on the clay tablets of Ancient Babylon and on Egyptian papyri. Even without written evidence we can be fairly certain that salt-making and use was a feature of

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life in all ancient communities.

Considering its chemical and physical properties, Sodium Chloride is usually found as a clear or white solid, occasionally found in uncommon colors like blue, pink, purple, yellow and gray with a vitreous luster. The crystals are either transparent or translucent with an isometric crystal system, predominantly in the shape of cubes but also granular, fibrous and compact. Cleavage of these crystals is perfect in three dimensions, thereby forming a cube-like structure. They have a conchoidal fracture with a white streak and a specific gravity equal to +2. 1 which is light. The Relative Molecular Mass of this compound is 58. 44 with a relative hardness of 2. For every gram of salt, almost 40 per cent is Sodium (Na) and over 60 per cent is Chlorine (Cl). Associated minerals include other deposit minerals like some sulphates, halides and borates. Best field indicators for Sodium Chloride are taste, cleavage and crystal habit. It stable under ordinary conditions of use and storage. However, when heated to above 801C (1474 F), it emits toxic fumes of chloride and sodium oxide. It does not have a tendency to undergo hazardous polymerization and is incompatible with Lithium, Bromine and Tri-fluorides and therefore should not be combined with them. Salt has low toxicity and is completely non-flammable.

Some of the potential health risk factors that can be caused by the salt include mild irritation to the respiratory tract if inhaled, irritation to the already damaged skin, irritation in the eyes followed by redness and pain for salt concentrations greater than the normal saline present. Finally, very large doses of the salt can cause vomiting, diarrhea and prostration followed by dehydration and congestion in most internal organs. Hypertonic salt

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solutions can also produce violent inflammatory reactions in the gastrointestinal tract. Moreover, environmental impact of salt manufacture and supply is minimal. Sodium Chloride is not classified as dangerous to the environment and the manufacture of salt does not require registration under the Environmental Protection Act Integrated Pollution and Control Regulations.

Sodium Chloride has played its role in the lives of people from the beginning. Egyptians used to mummify their dead with salt as the preservative and until recently, salt bars had been the standard currency of Ethiopia. The importance of salt in the Arab countries is so much that if someone ate another man's salt, they could not harm the man in any way whilst in his home, and the man would not harm them.

Today, one of the key factors which keep our industries running is Sodium Chloride. Salt is used to manufacture some 14, 000 products. The properties of Chlorine and Sodium and the principal compounds from them make it one of the most important of the basic raw materials which are being used by our industries. Softening of hard water is one of its major uses where Sodium is used from the salt. Chlorine compounds of commercial importance include Hydrochloric Acid and Sodium Hypochlorite. Important Sodium compounds include Sodium Carbonate (soda), Sodium Sulphate, baking soda, Sodium Phosphate and Sodium Hydroxide.

Typically, salt is used in the de-icing of roads in winter, directly in industries for dyeing textiles and curing animal hides. Also, Sodium Chloride is used for windows, lenses and prisms where transmission in the 0.25 μ m - 16 μ m range is desired. Because of its low absorption, Sodium Chloride is being used in high power laser systems. Polished surfaces must be protected from

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moisture by exposing them to only dry atmosphere or by using a heating element to keep the surfaces above ambient temperature. Sodium Chloride can be used at temperatures up to 400 C. The salt is also used is also a good test for cystic fibrosis and this can be done by testing the salinity of perspiration. Another very important use of Sodium Chloride is in the removal of traces of water from aviation fuel after it is purified. It is also used for glazing pottery and the early manufacture of Chlorine. It is widely used as a preservative for meats and is employed in some refrigeration processes and in the manufacture of soap, a process known as saponification. It's constituent, Chlorine, is used in the manufacture of PVC, which is contained in a vast number of products including blood bags and the tiny catheters used to help keep premature babies alive.

Sodium Chloride is also used in the cosmetics industry for its natural cleansing, toning, re-freshening, astringent, antiseptic and moisture absorption properties in the manufacture of astringents and anti-inflammatory products because it softens skin and acts as a re-mineralizing, detoxifying cleanser that draws impurities out of the body through the skin. It also stabilizes the cosmetic products' viscosity. Examples would include Marykate Moisture Absorber, Pert Plus Shampoo plus Conditioner for Normal to Dry Hair, Aveeno Skin Clarifying Toner with Soy Extract, Alcohol-free etc. Over the years, our uses for salt have grown. As knowledge and ambition have developed, we have found ingenious ways to make use of this wonder compound. As such, Sodium Chloride has been the catalyst that has inspired what has now evolved into today's chemical industry.

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