Sodium Cyanide MarketStrategies: Market Growthaa

Introduction

Sodium cyanide is an odorless chemical compoundwith the formula NaCN. It is a white, water-solublesolid. NaCN has a wide range of industrial and otherapplications, but it is also notoriously toxic and hassometimes been used for suicide or murder. Let’sexplore some key facts about this dangerouschemical compound.

Chemical Properties and Structure

Sodium cyanide has the chemical formula NaCNand a molar mass of 49.01 g/mol. It dissociates in water to give hydroxide (NaOH) and cyanide (CN-)ions. The cyanide ion is linear with carbon and nitrogen separated by a triple bond. It is this CN- ionthat is primarily responsible for NaCN ‘s high toxicity.NaCN is a white solid that melts at 563°C to give acolorless liquid. It is highly soluble in water.

Toxicity and Mode of Action

Cyanide is an inhibitor of cytochrome c oxidase, animportant enzyme in the mitochondrial electron transport chain. By blocking this enzyme, cyanideessentially prevents aerobic respiration fromtaking place at the cellular level. This leads to a rapiddepletion of oxygen to tissues and ultimatelycauses death due to hypoxia at the tissue and organ level.

The lethal dose of NaCN for adult humans isreported to be 200-300 mg. However, as little as 1-5 grams can prove fatal. The primary symptoms ofcyanide poisoning include headaches, dizziness, confusion, convulsions and cardiac arrest. Death by cyanide poisoning usually occurs within minutes to an hour. There is no antidote for cyanide poisoning. Treatment focuses on supportive measures in a hospital environment along with use of antidotes like sodium thiosulfate or dicobalt edetate to combat the effects of cyanide.

Industrial Uses

Despite its obvious toxicity, NaCN has many beneficial industrial applications primarily due to its ability to dissolve minerals containing precious metals like gold and silver. It is widely used for extraction of these metals via cyanidation process in mining operations. In this process, an aqueous solution of NaCN is used to leach gold from minerals into the water to facilitate separation and recovery of gold. NaCN is also used in some cleaning and metal surface treatment applications.

Other uses include: