

Hydrogen Cyanide - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

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Abstracts

The Hydrogen Cyanide Market size is estimated at 2.39 Million tons in 2024, and is expected to reach 2.62 Million tons by 2029, growing at a CAGR of greater than 1.5% during the forecast period (2024-2029).

The majority of the hydrogen cyanide manufactured is used as a raw material for adiponitrile production, which is used in producing nylon 66 for fiber and plastic production. Adiponitrile (AND) is used to make hexamethylene diamine (HMDA), the majority of which (approximately 92%) is used to make nylon 6,6 fibers and resins.

Over the medium term, the major factors driving market growth were the high demand for sodium and potassium cyanide and the increasing use of hydrogen cyanide in producing adiponitrile.

On the flip side, the highly toxic nature of hydrogen cyanide hampers the market's growth studied.

Its use in the production of chelating agents in untapped markets is likely to present opportunities in the future.

North America is expected to dominate the global hydrogen cyanide market, while the Asia-Pacific region is expected to be the fastest-growing market during the forecast period.

Hydrogen Cyanide Market Trends

Sodium and Potassium Cyanide Application to be the Fastest Growing Segment

Hydrogen cyanide, as a precursor of sodium cyanide and potassium cyanide, is commonly used for electroplating and mining of metals such as silver and gold.

The wet process produces sodium cyanide (NaCN) or the neutralization of hydrogen cyanide with sodium hydroxide. The HCN is added both in the form of a gas or liquid, and NaOH is added as an aqueous solution to form an aqueous NaCN solution. Furthermore, solid NaCN crystals can be formed during evaporation of the aqueous NaCN solution.

Potassium cyanide (KCN) is formed by the treatment of hydrogen cyanide with an aqueous potassium hydroxide solution, followed by the vacuum evaporation of the solution.

Both sodium cyanide and potassium cyanide are important chemicals used in various industrial processes, including gold extraction, electroplating, and chemical manufacturing.

Sodium cyanide and potassium cyanide are majorly used in the extraction of gold and silver from low-grade ores.

Potassium cyanide and sodium cyanide are also widely used for the production of nitriles and carboxylic acids.

According to the US Geological Survey, in 2022, global gold production reached 3,100 metric tons. China led global gold mine production, with an estimated 330 metric tons produced in 2022, followed by Australia, producing about 320 metric tons in the same year.

The countries with the largest estimated gold reserves are Australia, Russia, and South Africa. Furthermore, Canada's mining industry is the world's biggest producer of potash and is in the top five producers of gold. The Pure Gold Red Lake Mine project in Ontario, Canada's newest gold mine, began commercial operations in August 2021 and was estimated to add 87.8 koz of gold yearly.

Following Russia's invasion of Ukraine, the chemical industry experienced a year marked by further bottlenecks in global supply chains already strained by rising energy and raw material costs, a pandemic, economic uncertainty, and political turmoil in 2022.

According to a report published by BASF 2022, global chemical production (excluding pharmaceuticals) is expected to increase by 2.0% in 2023, with a Y-o-Y increase of 2.2% from 2022.

In China, the world's largest chemicals market, a slight slowdown in chemical production growth is expected in 2023. The country's chemical production grew by 5.9% in 2022. The opening up of the Chinese economy is expected to boost domestic demand growth in China, especially in the consumer goods and health and nutrition sectors, and contribute to positive growth in the industry.

With the consideration of all these factors, the overall market is expected to witness positive growth during the forecast period.

North America to Dominate the Market

According to the ITC trade map, the United States was the largest exporter of hydrogen cyanide in the year 2022, exporting about 87 tons of hydrogen cyanide in 2022.

Currently, there are no major country-wide regulations regarding the cyanide product ban. However, states such as Montana, Colorado, and Wisconsin have some restrictions preventing specific cyanide usage in the country.

The demand for hydrogen cyanide in the region is driven by applications such as the production of adiponitrile, which is used for nylon and polyamides production; the production of acetone cyanohydrin for acrylic plastics, which is further used in paints and coatings; for production of sodium cyanide and potassium cyanide for gold recovery, and cyanuric chloride for pesticides and other agriculture products.

The country is among the world's major producers of gold and silver. According to the US Geological Survey, in 2022, the country was the 5th largest producer of gold globally, with a total production of about 170 metric tons.

According to the Silver Institute, the United States was the world's ninth-largest producer of silver in 2022, producing 41.1 million ounces (~1,165.17 metric tons) of silver, which is 6% more than the production in 2021.

Along with the abovementioned applications, the demand for the market studied in the

country is also driven by the agricultural industry in the country, as cyanuric chloride produced using hydrogen cyanide is also used for the production of pesticides and other agricultural products.

Plastic industries' demand for acetone cyanohydrin further adds to the market's consumption.

The plastic industry's growth is currently affected by increasing environmental pollution due to the huge amount of plastic waste. According to the Canadian government, about 15 billion plastic bags and about 57 million plastic straws are used annually in the country.

Hydrogen cyanide-based chemicals, i.e., sodium cyanide and potassium cyanide, find significant applications in the mining process of gold and silver.

According to USGS, the country is 4th largest producer of gold after China, Australia, and Russia, with gold production of about 220 tons in the year 2022.

The country is also among the top 15 major silver-producing nations in the world. According to the Silver Institute, the government has produced about 8.7 million ounces of silver (246.64 metric tons), a decline of about 5% compared to 2021.

The agriculture industry's demand for pesticides and other products also contributes to the country's significant consumption of hydrogen cyanide.

The agriculture industry is a significant contributor to the Canadian economy. Agriculture and Agri-Food Canada (AAFC) said that in 2022, Canada was the world's fifth largest agricultural exporter.

All such trends are likely to impact the market demand over the forecast period.

Hydrogen Cyanide Industry Overview

The global hydrogen cyanide market is partially consolidated. The major companies include (not in a particular order) INVISTA, Evonik Industries, INEOS, Butachimie Chalamp?, Drasslok, and Asahi Kasei Corporation, among others.

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