ASCENSUS™

Specialty Chemical Overview

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Sodium Borohydride

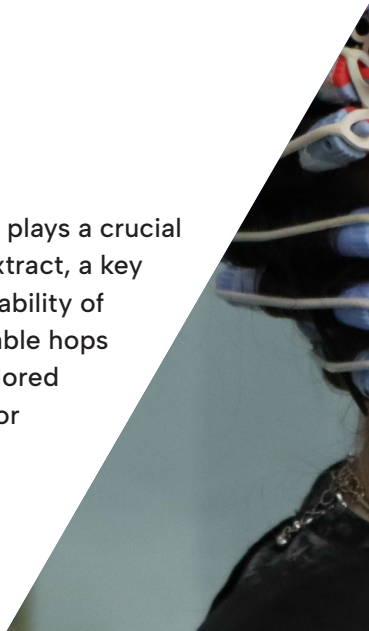
Life Sciences

Sodium borohydride is extensively used in the synthesis of active pharmaceutical ingredients (APIs), particularly in the production of antiretrovirals, oncology drugs, and other vital medications.

Additionally, it is used in the purification of ethanol for use in pharmaceutical applications, such as cough medicine and hand sanitizers, which are tightly regulated and require high purity standards. Borohydride removes oxidized impurities from the ethanol stream without reacting with the ethanol itself allowing for the cost-effective removal of impurities.

Textiles

Sodium borohydride enables vat dyeing with deep and consistent color penetration into fabrics while ensuring color fastness and fabric quality. Its application extends to the reductive cleaning and stripping processes, where it effectively removes unwanted dye residues, preserving fabric strength and improving the overall finish of the textile products. It's efficiency and reliability make it an essential component in textile manufacturing, contributing to both the aesthetic and functional quality of a wide range of textile goods.



Food and Beverage

In the brewing industry, sodium borohydride plays a crucial role in the production of light-stable hops extract, a key ingredient used to enhance the flavor and stability of beer. As a result, beers treated with light-stable hops extract can be packaged in clear or light-colored bottles without the risk of light-induced flavor degradation, offering breweries greater flexibility in packaging design while ensuring the beer's flavor integrity.

Water Treatment and Metal Recovery

In water treatment, borohydride is primarily used for the reduction of metal ions by precipitating the heavy metals from wastewater that can be safely removed. This application is crucial in industries where metal-laden effluent is a byproduct, such as in mining, metal plating, and manufacturing. Additionally, it can be used in the treatment of industrial effluents to reduce and remove organic pollutants, thereby decreasing the overall toxicity of the wastewater. Its efficacy in removing harmful contaminants underlines the importance of borohydride compounds in promoting safer and more sustainable water management practices.

Electronic Materials

Sodium borohydride finds use in the electronics industry as a primary starting material for the production of diborane gas which is used to produce the latest in DRAM memory used in solid-state storage for computers and mobile phones.

Surfactants

High quality surfactants have stringent color and odor standards to be used in the Home and Personal Care industry. Sodium borohydride is used to remove small oxidative impurities from the surfactant alcohols along with the final products to ensure consistency.

Boranes for Adhesives

In addition to its role as a co-initiator in anaerobic adhesives, triethylborane (TEB) also improves adhesion to challenging substrates like polyethylene and polypropylene. These two plastics are notoriously difficult to bond due to their low surface energy, making traditional adhesives less effective.

TEB can be employed as a surface treatment agent in a process known as surface activation or priming. When applied to the surface of polyethylene or polypropylene, TEB interacts with functional groups on the polymer's surface, creating active sites that increases the adhesion of adhesives, coatings, or inks. This surface activation step is crucial in various industries, including packaging, automotive, and electronics, where the need to bond or print on these plastics is common. TEB's ability to enhance adhesion to polyethylene and polypropylene substrates significantly expands its utility in adhesive formulations, making it a valuable component in a broader range of applications.

KOMe for Biodiesel and Runway Deicing Solutions

Potassium methoxide, a versatile chemical compound composed of potassium and methoxide ions, plays a crucial role in various industries. In biodiesel production, it it's prominently used as a catalyst for the transesterification process. Potassium methoxide facilitates the reaction between triglycerides (found in fats or oils) and methanol, resulting in the production of methyl esters, which are essential components of biodiesel fuels. This contribution to the biodiesel industry promotes cleaner and more sustainable energy sources.

Additionally, potassium methoxide is involved in the production of potassium formate-based runway deicing solutions. Potassium formate, derived from formic acid and potassium hydroxide, is an effective agent for lowering the freezing point of water. When potassium methoxide is employed to synthesize potassium formate, the resulting deicing solution can be applied to runways and other icy surfaces to melt snow and ice, ensuring safe take-offs and landings. Importantly, these deicing solutions are less environmentally harmful and less corrosive to infrastructure compared to traditional chloride-based alternatives, making them a preferred choice in aviation and winter maintenance industries, aligning with sustainability and safety goals.

KTB, Potassium tert-butoxide

Potassium tert-butoxide (KOtBu) is a potent chemical compound with a wide range of applications in diverse fields beyond pharmaceutical synthesis. As a strong base, KOtBu plays a pivotal role in organic chemistry, where it is commonly used for deprotonation reactions, enabling the synthesis of various organic compounds like polymers, agrochemicals, and specialty chemicals. Its versatile reactivity extends to polymer chemistry, where it contributes to the production of polymers and plastics, including polyolefins and specialty polymers. Additionally, KOtBu is employed in the synthesis of agrochemicals, herbicides, insecticides, and other compounds relevant to the agricultural industry. In chemical research and laboratory settings, it serves as a valuable reagent, assisting in the creation of new compounds and materials. Moreover, KOtBu finds application as a base catalyst, promoting specific reactions such as esterifications and alkylations, and can even be used in fuel formulations, specialty chemicals, organic electronics, and photovoltaic materials.

In summary, potassium tert-butoxide's versatility and strong basicity make it an indispensable tool in various scientific and industrial endeavors, facilitating reactions that lead to the development of a wide array of essential products and materials across multiple fields, from chemistry and agriculture to materials science and beyond. Its broad range of applications underscores its significance as a catalyst and reagent, contributing to advancements in research and technology across numerous industries.

Chemistry Made for What Matters

TMB for Solder Flux, Coating Applications

Trimethylborate, a versatile chemical compound, finds a wide range of applications across multiple industries. In organic synthesis, it serves as a valuable reagent and catalyst, playing a pivotal role in the preparation of boron-containing organic molecules used in medicinal chemistry, materials science, and agrochemicals. Its ability to facilitate hydroboration, Suzuki-Miyaura coupling, and boronate ester formation enables the efficient synthesis of complex organic structures.

In the electronics industry, trimethylborate is utilized as a precursor for boron-doped silicon, crucial for semiconductor fabrication. By introducing controlled amounts of boron into silicon wafers through the chemical vapor deposition (CVD) process, it allows for precise tuning of semiconductor conductivity, a fundamental aspect in the production of transistors and diodes.

Trimethylborate also plays a significant role in welding as a fluxing agent, aiding in the removal of oxides and impurities from metal surfaces during welding. This contributes to cleaner, stronger weld joints, ensuring high-quality connections in manufacturing and construction.

Furthermore, in the realm of coatings, trimethylborate is utilized to enhance and protect various materials, including ceramics, glass, and metals. By participating in the formulation of silicate coatings, it provides resistance to heat, chemicals, and abrasion, making these coatings valuable in industries like refractory materials, glassware production, and the protection of metal components in harsh environments. Trimethylborate's versatility and unique properties make it an essential component in a diverse array of applications, from chemistry and electronics to welding and coatings, driving advancements in numerous industries.

NaK for Surfactant Alcohols and Ibuprofen

Sodium-Potassium alloy is a highly reducing alkali metal composition that finds use in two major areas, the production of ibuprofen and the synthesis of surfactant alcohols. NaK is essential for the large scale production of isobutylbezene from toluene and propylene, "ibu" to ibuprofen.

In surfactant alcohols, NaK is used to break long chain olefins into valuable molecular weights enabling the efficient production of detergent alcohols widely used in Home and Personal Care applications.

TEB for Ignition Sources

Triethylboron (TEB) serves as a pivotal ignition source in aerospace and military applications, exemplified by its use in jet engines, rockets, and gas turbine engines. Its remarkable pyrophoric properties are exemplified when it spontaneously ignites upon contact with air, rendering it an invaluable and immediate ignition solution. For instance, TEB is injected into the combustion chamber of rocket motors, such as those used in space exploration, ensuring prompt and reliable ignition. In the case of jet engines, TEB is utilized for initiating the combustion process, as seen in military aircraft like fighter jets, to swiftly and efficiently start the engine, thus enhancing overall performance and reliability in critical ignition scenarios.

ASCENSUS™
SPECIALTIES

Headquartered in Bellevue, WA, **Ascensus Specialties offers an unparalleled range of specialty reagents that enable complex transformations so our customers can continue to make the products that matter.** Our 60+ years of synthetic knowhow, allows us to bring additional value to our clients through our excellent manufacturing practices and expertise. From world-class production plants in Elma, WA, Evans City, PA, Newburyport, MA, and Cambridge, UK, Ascensus has a global reach that ensures our clients can consistently manufacture their products to the highest standards.

THE ASCENSUS ADVANTAGE

- **60+ Years Of Experience**
- **Superior Performance**
- **Supply Chain Development**
- **Process Control And Robustness**
- **Safety Focus**

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