

Sodium Bromide

Sodium and bromide ions inorganic salts that occur naturally in seawater and other surface and underground waters used to manufacture sodium bromide. The sodium bromide supplied by LANXESS Solutions US Inc. is a concentrated and purified form of the naturally occurring inorganic salt. It is supplied as a dry powder or a concentrated aqueous solution for a number of applications in the energy sector. Sodium bromide is used in fluids for oil and gas extraction, as a mercury-removal treatment for coal-fired power plants, as a chemical intermediary and in water treatment applications.

Like ordinary table salt, sodium bromide can be corrosive to certain metals and can be corrosive or irritating to the skin, respiratory tract, mucous membranes and eyes.

Identification

Products sold by LANXESS Solutions US Inc. that contain sodium bromide include:

- GeoBrom[®] HG400
- GeoBrom HG40S
- GeoBrom HG430
- GeoBrom HG430
- *Sodium Bromide Dry*
- *Sodium Bromide Liquid OFA*

In addition to the trade names, *Sodium Bromide* is also identified as follows:

- NaBr
- CAS Number 7647-15-6

Description

Production:

Sodium bromide is made using hydrogen bromide, sodium hydroxide and water in manufacturing units designed for this purpose. Aqueous sodium bromide solutions are prepared at specified concentrations for particular applications. Solid sodium bromide products are made by drying sodium bromide solutions. After manufacture, liquid and solid sodium bromide products are packaged for shipment. Solid sodium bromide is typically dissolved into water prior to use.

Uses:

Within the energy sector, sodium bromide is used as a component of drilling and completion fluids, which are used to maximize the productivity of an oil well, to minimize site erosion of the well and to aid in the shutdown of the well. Sodium bromide is also used as a component of fracturing fluids to aid in efficient recovery of natural gas from underground deep-rock formations.

Coal-fired power plants can be a major source of atmospheric mercury emissions. When used by coal-fired power plants, sodium bromide safely and effectively traps and helps remove mercury so it is not released into the atmosphere.

Highly refined grades of sodium bromide are used in the manufacture of fine chemicals and intermediates. Sodium bromide is also registered for use as a water treatment chemical in certain applications.

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| Properties: solid | Appearance: | white crystalline or powdered solid |
| | Melting Point: | 755 °C |
| | Water Solubility: | 95 g/100 g at 25 °C |
| liquid | Appearance: | colorless liquid |
| | Weight per gallon: | 12.4-12.5 ppg |

Potential Human Health Effects

Sodium bromide is a corrosive material, and contact with a liquid or powder can irritate or damage the skin and mucous membranes. The eyes can be especially susceptible to the corrosive effects of sodium bromide. Dust from dry powder that is breathed in could severely irritate or damage the nose, throat and lungs. If, despite the use of personal protective equipment, contact with the liquid or solid occurs, the affected area should be washed thoroughly with water for an extended period of time to avoid the irritating effects of exposure.

Industrial Use:

Sodium bromide is handled in various highly controlled facilities by properly-trained personnel. Sodium bromide will be handled using techniques developed to minimize any potential exposure to the liquid or solid. Employees handling sodium bromide are required to wear specialized clothing for additional protection. Unplanned releases or spills of sodium bromide are not expected to present an immediate danger to life and health since the salt will not vaporize, although airborne dust may irritate or injure the eyes, nose, throat and lungs. In any spill or release incident, all non-essential personnel should be immediately evacuated upwind of the spilled material. All personnel involved with correcting the situation should be properly trained and equipped with the required personal protective equipment.

Consumer Use:

Consumers are not exposed to sodium bromide distributed by LANXESS Solutions US Inc. because it is not sold directly to consumers nor do we endorse sales to consumer markets.

Environmental Release:

Sodium bromide is handled using highly-engineered systems designed to minimize any release to the environment. In a spill incident, the salts solution or powder should be contained until it can be transferred to another container. If sodium bromide is spilled onto soil or other porous materials the contaminated materials should be removed and disposed of in a proper manner.

Physical Hazards

Sodium bromide is sold as either a dry white powder or as a water-based solution. A solution of sodium bromide will look like water; however, an equal volume will be much heavier than water. As is the case with other inorganic salts such as common table salt, sodium bromide can be corrosive towards metals, especially when moist and in high concentrations. Consequently, common metals may rust in the presence of sodium bromide. Because it is a salt, it has a high affinity for water and will absorb moisture from the air. Powdered sodium bromide left in a moist environment may aggregate to form larger 'bricks' of sodium bromide solids. As a salt it also can lower the freezing point of water or melt existing ice even at sub-zero temperatures.

Aqueous solutions of sodium bromide can also be corrosive, similar to the behavior of other common salt solutions like seawater.

Potential Environmental Impact

Environmental Fate Information:

Sodium bromide is generally non-reactive and very water soluble. It is not regulated as Dangerous Goods (also known as "hazardous materials" or "HAZMAT" in the United States) for transport by air, land or sea because it is generally considered to present minimal hazard to people and the environment. Because it is a salt, it will readily dissolve in and be diluted by water. It is corrosive both as a solid and in solution. In a release onto hard surfaces, the salt solution or dry powder should be contained until it can be transferred to another container. If sodium bromide is spilled onto soil or other porous material, the contaminated materials should be removed and disposed of in a proper manner.

Aquatic and/or Terrestrial Toxicity:

The sodium and bromide ions that make up sodium bromide salts occur naturally in the environment. Therefore, the impact of low levels of this material in the aquatic or terrestrial environment is expected to be insignificant. Similar to table salt, if sodium bromide levels in water or soils are raised to a high enough concentration, toxicity could be a concern. Consequently, sodium bromide should not be released into the environment or flushed into fresh surface waters or sanitary sewer systems. Consult the Safety Data Sheet for specific hazards associated with the grade of sodium bromide of interest.

Product Stewardship

Manufacturing locations:

In the manufacturing plant, facility management procedures, Safety Data Sheets, technical guidance documents, and training are used to communicate safe handling, risk mitigation measures, and emergency response requirements to employees. LANXESS Solutions US Inc. supplies sodium bromide to companies who have a long history and/or experience in using sodium bromide products in their applications.

Environment:

Though sodium bromide is not regulated as a hazardous material, there are prudent steps that should be taken in the event of an environmental release. If sodium bromide is spilled, trained professionals are available to assist with the situation.

Consumers:

Consumers are not exposed to sodium bromide distributed by LANXESS Solutions US Inc. because it is not sold directly to consumers nor do we endorse sales to consumer markets.

LANXESS Solutions US Inc. conducts an ongoing analysis of its products to evaluate potential risk areas throughout the product's life cycle. Chemical risks are identified at the very early stage of new products. They are evaluated by stage-gated reviews using environmental, health, and safety (EHS) criteria. The analysis of existing products will evaluate raw materials, manufacturing, transportation, customer end-use and disposal. Additionally, before changes in existing product formulations are made, a detailed evaluation is made of the proposed change. A critical component of all of these processes is the Safety Data Sheet, which lists detailed product hazard information and appropriate protective measures.

Potential product risks are managed using internal and external controls. In the context of a continually improving risk-reduction program, periodic reviews of the current controls are conducted in order to identify opportunities for improvements or enhancements. This includes adaptation of existing procedures to changes in regulations (e.g., covering workplace and transportation).

Conclusion

Sodium bromide is a useful material that can be formulated to liquid densities suitable for a wide variety of applications within the energy industry sector. It is also used in the manufacture of fine chemicals, as a

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chemical intermediate and in water treatment applications. Sodium bromide is only handled by highly trained people in manufacturing environments utilizing specialty equipment, safety controls, and personal protective equipment. There are relatively few locations around the world where sodium bromide is made and used.

Contact Information

LANXESS Solutions US Inc.

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Notices

Use and Application Information

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by us. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale. All information and technical assistance is given without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent.