Tributyltin compounds, Tributyltins

LANXESS Solutions US Inc. is a global partner for the manufacturing, marketing, and development of specialty organometallic products. These products are used in polymer production, synthesis of fine chemicals and pharmaceuticals, processes for production of photovoltaic modules, and glass coating and automotive anticorrosion coatings.

Today, the main applications for tributyltin compounds include the manufacturing of PVC heat stabilizers as well as highly active and selective reagents for special organic synthesis (e.g., pharmaceutical manufacturing).

Identification

Product Trade Names

- TBTO
- TBTCl
- TBTH
- AXION® PS 3410
- AXION PS 3430

Chemical Names

- Tributyltin oxide (hexabutyldistannoxane)
- Tributyltin chloride
- Tributyltin hydride (tributylstannane)

Description

Many pharmaceuticals could not be synthesized without organometallics as a helping agent. Organometallics support pharmaceutical active substances to eliminate pathogens, diseases and parasites within the human body.

Organometallics are also important for the modern energy supply, as they are used in the production of photovoltaic modules to convert sunlight into electric current.

The tinorganic compounds are used as reagents similar to a catalyst and chemical intermediates. Therefore, they are not visible in the final product, as they will be transformed into other materials during the various production processes or separated from the final product to be either destroyed or even recycled.

Physical/Chemical Properties:

The substances are difficult to ignite, substantially insoluble in water and non-volatile, but they are still harmful to the environment. They are liquids that vary in color from colorless to yellowish.

They can also lead to acute and chronic health hazards. This is the reason they may only be handled by trained, appropriately protected, and equipped employees.

Health Effects:

Tributyltins are toxic. The principal health effect after inhalation or absorption through the skin is corrosive and irritant effects to the mucous membranes, eyes and skin. Itching, irritation and blister formation may occur after being in contact with the substance through skin. In extreme cases, inhalation can lead to lung damage.

Potential Environmental Impact

The substances are highly toxic to aquatic organisms and can cause long-term harmful effects.

Release Control and Disposal:

Spill and leak control measures are used in manufacturing and storage.

To some extent, the material can be recycled. Contaminated material will be disposed of via combustion in accordance to the local official regulations.

Product Stewardship:

LANXESS SOLUTIONS US INC. conducts ongoing analyses of its products to evaluate potential risk areas throughout the products' life cycles. 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.

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

Regulatory Compliance:

Because tributyltins are reactive, many regulatory agencies supervise the transportation, use and disposal of these materials.

The Occupational Safety and Health Administration (OSHA) in the U.S., as well as various regulatory bodies in the EU, regulate the limits of exposure.

Various regulatory bodies such as the U.S. Department of Transportation and the International Maritime Organization often classify tributyltins for transport as toxic and environmentally hazardous. International shipping is controlled by the United Nations Transport of Dangerous Goods Code.

The use and disposal of tributyltins is covered in the U.S. by the Toxic Substances Control Act (TSCA) and in Europe by the REACH regulation.

Manufacturing and Processing:

Manufacturing takes place in closed systems, so releases and the dangers associated with them can be minimized. Production units are regularly inspected by third-party inspectors certified by regulatory authorities.
LANXESS SOLUTIONS US INC. has more than 50 years' experience in synthesizing and handling these compounds.

The LANXESS tributyltin product portfolio is manufactured in Bergkamen, Germany.

Transportation:

The substances are transported in suitable, tested and approved standard packaging in accordance with existing transport regulations.

Exposure Potential:

All processes, including manufacturing, transportation, disposal and emissions are controlled and regulated by state authorities and rules. Specific community and consumer exposure is not expected through normal distribution and use.

Due to the biohazard properties of tributyltin compounds, any exposure should be avoided. These materials could affect the body via the skin and the respiratory tract. Therefore, workers should not be exposed to aerosols during the manufacture, packaging, transportation or final application. Any residual tributyltins in finished goods are controlled so that there is no exposure from the final product to be considered.
Proper disposal of packaging is necessary, as well, to prevent accidental releases to the environment.
Employees dealing with these substances need to be trained on the material properties and have to wear special protective equipment when there is a possible risk for exposure.

LANXESS Solutions US Inc. sells these products only to approved customers, since their employees also have to receive the same training.

Conclusion

The products which were produced using tributyltin compounds are an integral part of daily life. While the tributyltins are practically not present in the final applications, they are essential to enable us to live as comfortable, safe and future-oriented as possible.

Contact Information

For more information, please contact us by our web site: http://www.LANXESS.com

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.