

Metallocenes

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, the synthesis of fine chemicals and pharmaceuticals, and in processes for the fabrication of semiconductor devices and photovoltaic modules.

Metallocenes are used in the production of a range of polymers. They are involved in the production of packaging materials, fibers and adhesives, as well as highly specialized materials for medical applications. Wherever high value polymers with very specific properties are required, metallocenes can potentially be applied in their synthesis.

Identification

- AXION[®] ZR 9030 / 9031 / 9032 / 9034 / 9035 / 9036 / 9037 / 9038
- Bis(methylcyclopentadienyl)zirconium dichloride
- Bis(n-butylcyclopentadienyl)zirconium dichloride
- Bis(indenyl)zirconium dichloride
- Bis(cyclopentadienyl)zirconium dichloride
- Bis(tetrahydroindenyl)zirconium dichloride
- rac-1,2-Ethylenebis(indenyl)zirconium dichloride
- rac-Dimethylsilylbis(indenyl)zirconium dichloride
- rac-1,2-Ethylenebis(tetrahydroindenyl)zirconium dichloride
- Ethylaluminium dichloride
- Diethylzinc
- Butylethylmagnesium
- Butyloctylmagnesium

Description

The most common use for metallocenes is in the production of high grade polyolefin products. Metallocenes are a pre-catalyst compound which is activated in situ by an activating agent so it can then act as a catalytic active intermediate.

Product Safety Assessment: Metallocenes

Metallocenes are also increasingly important in the production of semiconductor devices used in the fabrication of electronically-functional units such as OLED lighting.

Physical/Chemical Properties:

The high performance expected of metallocenes used in the polyolefin, pharmaceutical and electronic industries necessitates their manufacture to the highest purity and quality standards. Metallocenes react with water, oxygen and moisture by contact with air. Degradation of the products start immediately, even if it is not noticeable through visible change of color or morphology. As pre-catalysts, metallocenes show considerable reactivity to oxidizing and reducing agents. To ensure quality, metallocenes may only be handled by trained, appropriately-protected and equipped personnel.

Health Effects:

Contact with metallocenes can irritate the skin and may cause sensitization that increases irritation upon subsequent contact. The products can be harmful to the human body through inhalation and can cause risk of serious damage to the eyes.

LANXESS metallocenes products are sold only to industrial users.

Potential Environmental Impact

The potential for toxicity to aquatic organisms varies in intensity from irritant to toxic. Metallocenes may cause long-term adverse effects on the aquatic environment.

Product Stewardship:

LANXESS SOLUTIONS US INC. conducts ongoing analysis of existing products to evaluate potential risk areas throughout each product's life cycle. Elements evaluated include: raw materials, manufacturing, transportation, customer end use and disposal. New products are evaluated using environmental, health and safety (EHS) criteria. Additionally, before changes in existing product formulations are made, a detailed evaluation is conducted of the proposed change. A critical component of all of these processes is the Safety Data Sheet, which lists product hazard information.

Product Safety Assessment: Metallocenes

Potential 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 improvement or enhancement. Each product family is the responsibility of a designated product steward, who serves as the champion for continuous improvement through the risk evaluation and reduction process.

Manufacturers are advised, however, that the hazard information for a product is only one of several factors that can affect the potential risks presented by that product in any particular use or application. In using our products, manufacturers should follow proper use instructions and ensure that proper personal protective equipment is used. These are critical components in reducing the potential risks of any product.

Regulatory Compliance:

The Occupational Safety and Health Administration (OSHA) in the U.S., as well as various regulatory bodies in the EU, regulate the limits of acceptable exposure in the workplace. International shipping is controlled by the United Nations Transport of Dangerous Goods Code. The use and disposal of metallocenes is covered in the U.S. by the Toxic Substances Control Act (TSCA) and in Europe by the REACH regulation.

Manufacturing and Processing:

Production takes place in closed systems. These production units are regularly inspected by third-party inspectors certified by regulatory authorities. Metallocenes are produced by a variety of methods and chemical processes. LANXESS SOLUTIONS US INC. has more than 25 years of experience in synthesizing and handling these compounds. The LANXESS metallocene product portfolio is manufactured at our facility in Bergkamen, Germany.

Release Control and Disposal:

Spill and leak control measures are taken during both manufacturing and transportation. Metallocene production components must be destroyed by combustion, in compliance with all relevant regulations, in a recognized hazardous waste incinerator. Packaging cannot be reused after cleaning. The unique characteristics of each metallocene may require special control and disposal conditions for each product.

Transportation:

Specialized and approved packaging of various capacities, ranging from 0.5 kg to approximately 50 kg (depending on the specific product), are used for the safe transportation of metallocenes. Laboratory use

Product Safety Assessment: Metallocenes

quantities are packaged and shipped in smaller, coated glass bottles. All packaging complies with applicable transportation regulations.

Exposure Potential:

All processes, including manufacturing, transportation, disposal and emissions are controlled by each country's authorities and regulations. Consumers are not likely to be exposed through normal distribution and use.

Operators working with metallocenes must complete special training in the safe handling maintenance of these compounds. Personal protective equipment includes safety helmets with face shields, protective gauntlets and goggles.

Conclusion

Products produced using metallocene compounds are an integral part of daily life. While metallocenes are essentially not present in the final application, 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.