SAFETY DATA SHEET

1. Identification

Product identifier **Ninlaro**

Other means of identification

Synonyms Ixazomib citrate capsules 2.3 mg, 3 mg, 4 mg, Ixazomib citrate drug product, MLN9708, MLN2238 citrate ester drug product

Recommended use Pharmaceutical product.

This safety data sheet is written to provide health, safety and environmental information for people handling this formulated product in the workplace. It is not intended to provide information relevant to medicinal use of the product. In this instance patients should consult prescribing information/package insert/product label or consult their pharmacist or physician. For health and safety information for individual ingredients used during manufacturing, refer to the appropriate safety data sheet for each ingredient.

Recommended restrictions All other uses.

Manufacturer/Importer/Supplier/Distributor information

Main Office Takeda Pharmaceutical Company Limited
1-1, Nihonbashi-Honcho 2-chome, Chuo-ku, Tokyo 103-8668, Japan

SDS Information

US Office 500 Kendall Street, Cambridge, MA 02142, USA

CH Office Thurgauerstrasse 130, 8152 Glattpark-Opfikon (Zurich), Switzerland

E-mail Takeda-SDS@takeda.com

Emergency phone number Call CHEMTREC Day or Night
Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-741-5970 (collect calls accepted)
From anywhere in the world: +1 703-527-3887

Note) When calling Chemtrec for emergency, first tell the product name on SDS along with the SDS date.

Note) When transcribing the Chemtrec number to GHS label or others, the above note must be transcribed together.

2. Hazard(s) identification

Hazards for the product as sold

Physical hazards Not classified.

Hazards for the product as sold

Health hazards	Acute toxicity, oral	Category 2
	Reproductive toxicity	Category 2
	Specific target organ toxicity, repeated exposure	Category 1

Hazards for the product as sold

OSHA defined hazards Not classified.

Label elements

Signal word	Danger
Hazard statement	Fatal if swallowed. Suspected of damaging fertility or the unborn child. Causes damage to organs through prolonged or repeated exposure.
Precautionary statement	
Prevention	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection.
Response	If swallowed: Immediately call a poison center/doctor. Rinse mouth. If exposed or concerned: Get medical advice/attention.
Storage	Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	No additional hazards are known to be associated with the expected conditions of use at the time of publication. This document does not address hazards that may arise from uses not reasonably anticipated by the manufacturer.
Supplemental information	Finished Pharmaceutical products in their final packages are not subject to OSHA labeling requirements.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Microcrystalline cellulose	9004-34-6	*
Gelatin	9000-70-8	*
Ixazomib citrate	1239908-20-3	3 - 4
Titanium dioxide	13463-67-7	*
Talc	14807-96-6	*
Magnesium stearate	557-04-0	*
Black iron oxide	12227-89-3	*
Red iron oxide	1309-37-1	*
Yellow iron oxide	51274-00-1	*

Note 10 - The classification as a carcinogen by inhalation applies only to mixtures in powder form containing 1 % or more of titanium dioxide which is in the form of or incorporated in particles with aerodynamic diameter ≤ 10 µm.
Note V - If the substance is to be placed on the market as fibres (with diameter < 3 µm, length > 5 µm and aspect ratio ≥ 3:1) or particles of the substance fulfilling the WHO fibre criteria or as particles with modified surface chemistry, their hazardous properties must be evaluated in accordance with Title II of this Regulation, to assess whether a higher category (Carc. 1B or 1A) and/or additional routes of exposure (oral or dermal) should be applied.
Note W - It has been observed that the carcinogenic hazard of this substance arises when respirable dust is inhaled in quantities leading to significant impairment of particle clearance mechanisms in the lung. This note aims to describe the particular toxicity of the substance; it does not constitute a criterion for classification according to Regulation (EC) No 1272/2008, as amended.

Composition comments

* Proprietary.
All concentrations are in percent by weight.

4. First-aid measures

Inhalation	Powder: Move to fresh air. Call a physician if symptoms develop or persist.
Skin contact	Wash off with soap and water. Get medical attention if irritation develops and persists.
Eye contact	Rinse with water. Get medical attention if irritation develops and persists.

Ingestion	Large quantities: Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.
Most important symptoms/effects, acute and delayed	In clinical use, adverse effects may include: Dose limiting toxicities (DLTs) experienced in the dose-escalation cohorts overall included nausea, vomiting, syncope, rash, and peripheral neuropathy. Prolonged exposure may cause chronic effects.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.
General information	IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media	Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use water jet as an extinguisher, as this will spread the fire.
Specific hazards arising from the chemical	During fire, gases hazardous to health may be formed.
Special protective equipment and precautions for firefighters	Self-contained breathing apparatus and full protective clothing must be worn in case of fire.
Fire fighting equipment/instructions	Use water spray to cool unopened containers.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Large Spills: Stop the flow of material, if this is without risk. Sweep up and shovel material into suitable container for disposal. Following product recovery, flush area with water. Small Spills: Pick up with suitable appliance and dispose of. Clean surface thoroughly to remove residual contamination. Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not taste or swallow. Avoid prolonged exposure. When using, do not eat, drink or smoke. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Provide adequate ventilation. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities	Store locked up. Store in tightly closed container. Store away from incompatible materials (see Section 10 of the SDS). When quality control required, follow the storage condition specified separately.

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Permissible Exposure Limits (PEL) for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value	Form
Microcrystalline cellulose (CAS 9004-34-6)	PEL	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
Titanium dioxide (CAS 13463-67-7)	PEL	15 mg/m3	Total dust.

US. OSHA Table Z-3 Permissible Exposure Limits (PEL) for Mineral Dusts (29 CFR 1910.1000)

Components	Type	Value	Form
Microcrystalline cellulose (CAS 9004-34-6)	TWA	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
		50 mppcf	Total dust.
		15 mppcf	Respirable fraction.
Titanium dioxide (CAS 13463-67-7)	TWA	5 mg/m3	Respirable fraction.
		15 mg/m3	Total dust.
		50 mppcf	Total dust.
		15 mppcf	Respirable fraction.

US. ACGIH Threshold Limit Values (TLV)

Components	Type	Value	Form
Microcrystalline cellulose (CAS 9004-34-6)	TWA	10 mg/m3	
Titanium dioxide (CAS 13463-67-7)	TWA	2.5 mg/m3	Respirable finescale particles
		0.2 mg/m3	Respirable nanoscale particles

NIOSH. Immediately Dangerous to Life or Health (IDLH) Values, as amended

Components	Type	Value
Titanium dioxide (CAS 13463-67-7)	IDLH	5000 mg/m3

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Microcrystalline cellulose (CAS 9004-34-6)	TWA	5 mg/m3	Respirable.
		10 mg/m3	Total

Biological limit values No biological exposure limits noted for the ingredient(s).

Exposure guidelines Ixazomib citrate (CAS 1239908-20-3): TWA - 0,5 µg/m³ (Takeda internal value).

Appropriate engineering controls Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection If contact is likely, safety glasses with side shields are recommended.

Skin protection

Hand protection Wear appropriate chemical resistant gloves.
Impervious oil/water/chemical-resistant gloves (nitrile, etc.).
Gloves meeting EN374, ASTM F1001 or international equivalent standard are recommended.

Skin protection

Other Use of an impervious apron is recommended.

Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA 29 CFR 1910.134. Seek advice from supervisor on the company's respiratory protection standards.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Observe any medical surveillance requirements. Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Physical state	Solid.
Form	Hard capsules.
Color	2.3 mg: Light pink, 3 mg: Light grey, 4 mg: Light orange.
Odor	Property has not been measured.
Odor threshold	Property has not been measured.
Melting point/freezing point	Property has not been measured.
Boiling point or initial boiling point and boiling range	Not applicable, material is a solid.
Flammability	Property has not been measured.
Upper/lower flammability or explosive limits	
Explosive limit - lower (%)	Not applicable, material is a solid.
Explosive limit - upper (%)	Not applicable, material is a solid.
Flash point	Not applicable, material is a solid.
Auto-ignition temperature	Not applicable for product form.
Decomposition temperature	Property has not been measured.
pH	Not applicable, material is a solid.
Kinematic viscosity	Not applicable, material is a solid.
Solubility	
Solubility (water)	Property has not been measured.
Partition coefficient (n-octanol/water)	Not applicable to mixtures.
Vapor pressure	Not applicable, material is a solid.
Density and/or relative density	
Density	Property has not been measured.
Relative density	Property has not been measured.
Vapor density	Not applicable, material is a solid.
Particle characteristics	Property has not been measured.
Other information	
Evaporation rate	Not applicable, material is a solid.
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.
Viscosity	Not applicable, material is a solid.

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Contact with incompatible materials.
Incompatible materials	Strong oxidizing agents.

Hazardous decomposition products No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Inhalation Prolonged inhalation may be harmful.

Skin contact Prolonged skin contact may cause temporary irritation.

Eye contact Direct contact with eyes may cause temporary irritation.

Ingestion Fatal if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics Prolonged exposure may cause chronic effects. In clinical use, adverse effects may include: Dose limiting toxicities (DLTs) experienced in the dose-escalation cohorts overall included nausea, vomiting, syncope, rash, and peripheral neuropathy.

Information on toxicological effects

Acute toxicity Fatal if swallowed.

Ixazomib citrate (CAS 1239908-20-3)	Result: LD50 – not performed; estimated LD50, <5 mg/kg, derived on the mortality in 2 and 5-Cycle studies in rats (≥1 mg/kg) Result: MTD of ixazomib in Sprague-Dawley rats after a single oral gavage administration was 1 mg/kg – no deaths at this dose.

Skin corrosion/irritation Not classified.

Corrosivity

Ixazomib citrate (CAS 1239908-20-3)	Result: Ixazomib citrate and freebase API (MLN2238) caused severe irritation, resulting in irreversible tissue alteration.

Serious eye damage/eye irritation Not classified.

Eye

Ixazomib citrate (CAS 1239908-20-3)	Result: Studies on eye irritancy were not conducted, but Ixazomib is anticipated to be an eye irritant.

Respiratory or skin sensitization

Respiratory sensitization No data available.

Skin sensitization No data available.

Germ cell mutagenicity No data available.

Carcinogenicity No data available.
The product contains a small amount of a substance that is suspected of causing cancer. Inhalation of titanium dioxide dust may cause cancer, however due to the physical form of the product, inhalation of dust is not likely.

IARC Monographs. Overall Evaluation of Carcinogenicity

Titanium dioxide (CAS 13463-67-7)	2B Possibly carcinogenic to humans.

NTP Report on Carcinogens

Not listed.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Reproductive toxicity Suspected of damaging fertility or the unborn child.

Reproductivity

Ixazomib citrate (CAS 1239908-20-3)	Result: 1. Embryo-Fetal Development in Rats - oral - rat – NOAEL <0.2 mg/kg/3 days – for general toxicity of dams and NOAEL ≥ 0.6 mg/kg/3 days for reproductive toxicity and EFD effects. Result: 2. Embryo-Fetal Development in Rabbits- oral – rabbit – NOAEL 0.1 mg/kg/3 days – for general toxicity of dams and EFD effects and ≥ 0.1 mg/kg/3 days for reproductive toxicity.

Specific target organ toxicity - single exposure No data available.

Specific target organ toxicity - repeated exposure Causes damage to organs through prolonged or repeated exposure.

Ixazomib citrate (CAS 1239908-20-3)	Result: 1. Three-Month (5-Cycle) Intermittent-Dose Toxicology Study of Ixazomib Citrate - oral - rat – NOAEL 0.2 mg/kg -intestine and lymphoid tissue effects Result: 2. Six-Month (7-Cycle) Intermittent-Dose Toxicology Study of Ixazomib Citrate - oral - rat – NOAEL 0.2 mg/kg -intestine and lymphoid tissue effects. Result: 3. Nine-Month (10-Cycle) Intermittent-Dose Toxicology Study of Ixazomib Citrate - oral - dog – NOAEL 0.1 mg/kg -intestine and lymphoid tissue effects, peripheral nervous system effects.

Aspiration hazard Not relevant, due to the form of the product.

Chronic effects Prolonged exposure may cause chronic effects.

12. Ecological information

Ecotoxicity Not expected to be harmful to aquatic organisms.

Persistence and degradability No data is available on the degradability of this product.

Bioaccumulative potential No data available for this product.

Partition coefficient n-octanol / water (log Kow)

Ixazomib citrate (CAS 1239908-20-3)	2

Mobility in soil No data available.

Other adverse effects None known.

13. Disposal considerations

Disposal instructions Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations Dispose in accordance with all applicable regulations.

Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner.

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT

UN number UN3249

UN proper shipping name Medicine, solid, toxic, n.o.s. (Ixazomib citrate)

Transport hazard class(es)

Class 6.1

Subsidiary hazard -

Label(s) 6.1

Packing group II

Environmental hazards

Marine pollutant No.

Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

Special provisions T3, TP33

Packaging exceptions 153

Packaging non bulk 212

Packaging bulk 242

IATA

UN number UN3249

UN proper shipping name Medicine, solid, toxic, n.o.s. (Ixazomib citrate)

Transport hazard class(es)

Class	6.1
Subsidiary hazard	-
Packing group	II
Environmental hazards	No.
ERG Code	6L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	UN3249
UN proper shipping name	MEDICINE, SOLID, TOXIC, N.O.S. (Ixazomib citrate)
Transport hazard class(es)	
Class	6.1
Subsidiary hazard	-
Packing group	II
Environmental hazards	
Marine pollutant	No.
EmS	F-A, S-A
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Transport in bulk according to IMO instruments	Not applicable.

15. Regulatory information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are listed on or exempt from the U.S. EPA TSCA Inventory List.
This product may only be used for TSCA Exempt purposes such as R&D or Food, Drug or Cosmetic use.

Toxic Substances Control Act (TSCA)

All components are either listed on the TSCA 8(b) inventory and designated “active” or exempt from listing.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

SARA 304 Emergency release notification

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical	Yes
Classified hazard categories	Acute toxicity (any route of exposure) Reproductive toxicity Specific target organ toxicity (single or repeated exposure)

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)	Not regulated.

US state regulations

US. California. Candidate Chemicals List. Safer Consumer Products Regulations (Cal. Code Regs, tit. 22, 69502.3, subd. (a))

Titanium dioxide (CAS 13463-67-7)

US. Massachusetts RTK - Substance List

Microcrystalline cellulose (CAS 9004-34-6)
Titanium dioxide (CAS 13463-67-7)

US. New Jersey Worker and Community Right-to-Know Act

Not listed.

US. Pennsylvania Worker and Community Right-to-Know Law

Microcrystalline cellulose (CAS 9004-34-6)
Titanium dioxide (CAS 13463-67-7)

US. Rhode Island RTK

Microcrystalline cellulose (CAS 9004-34-6)
Titanium dioxide (CAS 13463-67-7)

California Proposition 65

WARNING: This product can expose you to Titanium dioxide, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

California Proposition 65 - CRT: Listed date/Carcinogenic substance

Titanium dioxide (CAS 13463-67-7)	Listed: September 2, 2011

16. Other information, including date of preparation or last revision

Issue date	25-September-2025
Revision date	-
Version #	01
References	IARC Monographs. Overall Evaluation of Carcinogenicity In-house data.
Disclaimer	Takeda Pharmaceutical Company Limited cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.