SAFETY DATA SHEET

Product Identifier: MIBItag Conjugation Kit (Lu)
Catalog ID number: 600175

SECTION 1 - IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Contact information

General	IONpath, Inc. 960 O'Brien Dr., Menlo Park, CA 94025 Main (U.S.): +1 (833) IONPATH (466-7284) E-mail: techsupport@IONpath.com
Emergency telephone number	CHEMTREC®, Inside the USA: 800-424-9300 CHEMTREC®, Outside the USA: 001-703-527-3887

Product identifier	MIBItag Conjugation Kit (Lu)
Synonyms	None identified
Trade names	None identified
Chemical family	Lanthanide component Mixture - contains nitric acid and metal lanthanide Stabilization Buffer component Mixture – contains sodium azide Polymer component – contains diethylenetriaminepentaacetic acid
Relevant identified uses of the substance or mixture and uses advised against	For research use only. Not for use in diagnostic procedures.
Note	This SDS is written to address potential health and safety issues associated with the handling of the formulated product.

SECTION 2 - HAZARDS IDENTIFICATION

Classification of the substance or mixture

Globally Harmonized System [GHS]	Polymer component: diethylenetriaminepentaacetic acid: Acute toxicity, Inhalation (Category 4), H332 Eye irritation (Category 2A), H319 Reproductive toxicity (Category 2), H361d Specific target organ toxicity – repeated exposure, Inhalation (Category 2), Respiratory Tract, H373 All other components: Not classified.
AU Hazard Classification (NOHSC)	Hazardous Substance. Non-hazardous goods.

Label elements

GHS hazard pictogram	Polymer component -- diethylenetriaminepentaacetic acid:  All other components: None required

SAFETY DATA SHEET

Product Identifier: MIBItag Conjugation Kit (Lu)
Catalog ID number: 600175

GHS signal word

Polymer component -- diethylenetriaminepentaacetic acid:
Warning

All other components: None required

GHS hazard statements

Polymer component: diethylenetriaminepentaacetic acid:
H319 Causes eye irritation.
H332 Harmful if inhaled.
H361d Suspected of damaging the unborn child.
H373 May cause damage to organs (Respiratory Tract) through prolonged or repeated exposure.

All other components: None required

GHS precautionary statements

Polymer component: diethylenetriaminepentaacetic acid:
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P264 Wash skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing Call a Poison Center / doctor if person is feeling unwell.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P337 + P313 IF eye irritation persists: Get medical advice/attention.
P501 Dispose of contents/container to an approved waste disposal plant.

All other components: None required

Other hazards

Stabilization Buffer component Mixture - contains sodium azide. The most common adverse effects reported with exposure to sodium azide include dizziness, headache, nausea and vomiting, rapid breathing and heart rate, restlessness, weakness, runny nose, cough, and red eyes. Overexposure to sodium azide may cause convulsions, low blood pressure, loss of consciousness, lung injury, reduced heart rate, and potentially fatal respiratory failure. Inhalation of sodium azide may cause respiratory irritation.

Other components - May cause eye/skin irritation. Mixtures not yet fully tested

Note

The mixtures are not classified as hazardous according to Regulation EC No 1272/ 2008 (EU CLP) and Hazard Communication Standard No. 1910.1200 (US OSHA). The pharmacological, toxicological and ecological properties of this mixture have not been fully characterized.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS #	EINECS/ ELINCS#	Amount	GHS Classification
Lanthanide Metal Mixture:				
Lutetium (III) Chloride	15230-79-2	N/A	1.4%	Not classified
Ammonium Acetate	631-61-8	211-162-9	<1%	EI2: H319; AA3: H402

Stabilization Buffer Mixture:				
Sodium Azide	26628-22-8	247-852-1	<0.1%	ATO2: H300; AA1: H400; CA1: H410; EUH032
Polymer Component:				
Diethylenetriaminepentaacetic acid	67-43-6	200-652-8	60-70%	Acute Tox 4; Eye Irritant 2A; Repr. 2 ; STOT RE 2 ; H319, H332, H361D, H373

Note Ammonium acetate and sodium azide are considered hazardous but are present at amounts below reportable limits. Lutetium (III) chloride is not considered hazardous. The remaining components are non-hazardous and/or present at amounts below reportable limits. See Section 16 for full text of GHS classifications.

SECTION 4 - FIRST AID MEASURES

Description of first aid measures

Immediate Medical Attention Needed Yes

Eye Contact If easy to do, remove contact lenses, if worn. Immediately flush eyes with copious quantities of water for at least 15 minutes. If irritation occurs or persists, notify medical personnel and supervisor.

Skin Contact Wash exposed area with soap and water and remove contaminated clothing/shoes. If irritation occurs or persists, notify medical personnel and supervisor.

Inhalation Immediately move exposed subject to fresh air. If not breathing, give artificial respiration. If breathing is labored, administer oxygen. Immediately notify medical personnel and supervisor.

Ingestion Do not induce vomiting unless directed by medical personnel. Do not give anything to drink unless directed by medical personnel. Never give anything by mouth to an unconscious person. Notify medical personnel and supervisor.

Protection of first aid responders See Section 8 for Exposure Controls/Personal Protection recommendations.

Most important symptoms and effects, both acute and delayed See Sections 2 and 11.

Indication of immediate medical attention and special treatment needed, if necessary Stabilization Buffer contains low levels of sodium azide. Medical conditions aggravated by exposure: None known or reported. Treat symptomatically and supportively.
All other components: No data available.

SECTION 5 - FIREFIGHTING MEASURES

Extinguishing media Use water spray (fog), foam, dry powder, or carbon dioxide, as appropriate for surrounding fire and materials.

Specific hazards arising from the substance or mixture No information identified. May emit carbon monoxide, carbon dioxide, nitrogen-, chloride-, and metal-containing compounds.

Flammability/Explosivity Not expected to be flammable or explosive.

Advice for firefighters Wear full protective clothing and a self-contained breathing apparatus with a full facepiece operated in the pressure demand or other positive pressure mode. Decontaminate all equipment after use.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	If product is released or spilled, take proper precautions to minimize exposure by using appropriate personal protective equipment (see Section 8). Area should be adequately ventilated. Do not breathe mist/vapors/spray.
Environmental precautions	Do not empty into drains. Avoid release to the environment.
Methods and material for containment and cleaning up	If vials are crushed or broken, DO NOT CAUSE MATERIAL TO BECOME AIRBORNE. For small spills, soak up material with absorbent, e.g., paper towels or sweep without creating dust. For large spills, cordon off spill area and minimize the spreading of spilled material. Soak up material with absorbent or sweep without creating dust. Collect spilled material, absorbent, and rinse water into suitable containers for proper disposal in accordance with applicable waste disposal regulations (see Section 13). Decontaminate the area twice.
Reference to other sections	See Sections 8 and 13 for more information.

SECTION 7 - HANDLING AND STORAGE

Precautions for safe handling	Follow recommendations for handling pharmaceutical agents (i.e., use of engineering controls and/or other personal protective equipment if needed). Avoid breathing vapor or mist. Do not permit eating/drinking/smoking near this material. All materials used for transferring or preparing this product must be considered contaminated and disposed of properly.
Conditions for safe storage including any incompatibilities	Keep from contact with clothing and other combustible materials. Store components at temperatures designated on their individual component labels. Avoid strong oxidizers. Store in tightly sealed containers that are appropriately labeled. Do not store in metal or glass containers. Do not store in direct sunlight. Do not store near organic substances.
Specific end use(s)	No information identified.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Note Dispose of broken vials/syringes in a sharps container.

Control Parameters/Occupational Exposure Limit Values

Compound	Issuer	Type	OEL
Lutetium (III) Chloride	--	--	--
Ammonium Acetate	--	--	--
Sodium Azide	ACGIH, Australia, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, U.S.-California OSHA, United Kingdom	OEL-STEL	0.3 mg/ml[3]
	New Zealand, Portugal	Ceiling	0.29 mg/m[3]

	ACGIH, Australia, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Malta, Netherlands, Poland, Romania, Slovakia, Slovenia, Spain, Sweden, U.S.- California OSHA, United Kingdom	OEL-TWA	0.1 mg/m^3
	NIOSH, U.S.- California OSHA	Ceiling	0.3 mg/m^3
	Germany	OEL-STEL	0.4 mg/m^3
	Germany	OEL-TWA	0.2 mg/m^3
Diethylenetriaminepentaacetic acid	--	--	--

Exposure/Engineering controls

Selection and use of containment devices and personal protective equipment should be based on a risk assessment of exposure potential. Use local exhaust and/or enclosure at mist/ aerosol/spray-generating points. Emphasis is to be placed on closed material transfer systems and process containment, with limited open handling. High- energy operations such as spraying or fluidizing should be done within an approved emission control or containment system.

Respiratory protection

Choice of respiratory protection should be appropriate to the task and the level of existing engineering controls. For routine handling tasks, an approved and properly fitted air-purifying respirator with appropriate HEPA filters should provide ancillary protection based on the known or foreseeable limitations of existing engineering controls. Use a powered air-purifying respirator equipped with appropriate HEPA filters or combination filters or a positive-pressure air-supplied respirator if there is any potential for an uncontrolled release, when exposure levels are not known, or in any other circumstances where a lower level of respiratory protection may not provide adequate protection.

Hand protection

Wear nitrile or other impervious gloves if skin contact is possible. When the material is dissolved or suspended in an organic solvent, wear gloves that provide protection against the solvent.

Skin protection

Wear appropriate gloves, lab coat, or other protective overgarment if skin contact is likely. Base the choice of skin protection on the job activity, potential for skin contact and solvents and reagents in use.

Eye/face protection

Wear safety glasses with side shields, chemical splash goggles, or full face shield, if necessary. Base the choice of protection on the job activity and potential for contact with eyes or face. An emergency eye wash station should be available.

Environmental Exposure Controls

Avoid release to the environment and operate within closed systems wherever practicable. Air and liquid emissions should be directed to appropriate pollution control devices. In case of spill, do not release to drains. Implement appropriate and effective emergency response procedures to prevent release or spread of contamination and to prevent inadvertent contact by personnel.

Other protective measures

Wash hands in the event of contact with this product/mixture, especially before eating, drinking or smoking. Protective equipment is not to be worn outside the work area (e.g., in common areas or out-of-doors).

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Clear liquids or powder
Color	Colorless
Odor	Odorless
Odor threshold	No information identified.
pH	No information identified.
Melting point/freezing point	No information identified.
Initial boiling point and boiling range	No information identified.
Flash point	No information identified.
Evaporation rate	No information identified.
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	No information identified.
Vapor pressure	No information identified
Vapor density	No information identified.
Relative density	No information identified.
Water solubility	Fully soluble in water.
Solvent solubility	No information identified.
Partition coefficient (*n-octanol/water*)	No information identified.
Auto-ignition temperature	No information identified.
Decomposition temperature	No information identified.
Viscosity	No information identified.
Explosive properties	No information identified.
Oxidizing properties	No information identified.

Other information

Molecular weight	Not applicable (Mixture)
Molecular formula	Not applicable (Mixture)

SECTION 10 - STABILITY AND REACTIVITY

Reactivity	Not expected to be reactive.
Chemical stability	Stable under normal handling and storage conditions.

Possibility of hazardous reactions	Not expected to occur.
Conditions to avoid	Keep away from incompatible materials.
Incompatible materials	Strong oxidizers.
Hazardous decomposition products	Hydrogen chloride gas, metal oxides.

SECTION 11 - TOXICOLOGICAL INFORMATION

Information on toxicological effects

Route of entry May be absorbed by inhalation, skin contact and ingestion.

Acute toxicity

Compound	Type	Route	Species	Dose
Lutetium (III) Chloride	--	--	--	--
Ammonium Acetate	LD_{50}	Intravenous	Mice	98 mg/kg
	LD_{50}	Intraperitoneal	Rat	632 mg/kg
	LD_{50}	Intraperitoneal	Mice	736 mg/kg
Sodium Azide	LD_{50}	Oral	Rat	27 mg/kg
	LD_{50}	Oral	Mouse	27 mg/kg
	LD_{50}	Dermal	Rabbit	20 mg/kg
Diethylenetriaminepentaacetic acid	LD_{50}	Oral	Rat	>2,000 mg/kg

Irritation/Corrosion

Polymer component: Diethylenetriaminepentaacetic acid
Skin – Rabbit
Result: No skin irritation

Eye – Rabbit
Result: Eye irritation

All other components: No studies identified.

Sensitization

Polymer component: Diethylenetriaminepentaacetic acid
Buehler Test – Guinea pig
Did not cause sensitization on lab animals.
(OECD Test Guidelines 406)

All other components: No studies identified.

STOT-single exposure No studies identified.

STOT-repeated exposure/Repeat-dose toxicity No studies identified.

Reproductive toxicity No studies identified.
Polymer component: Diethylenetriaminepentaacetic acid is a suspected human reproductive toxicant suspected of damaging the unborn child.

Developmental toxicity Polymer component: Diethylenetriaminepentaacetic acid
Rat – Oral
Specific Developmental Abnormalities: Musculoskeletal system.

All other components: No studies identified.

Genotoxicity No studies identified.

Carcinogenicity No studies identified. The ingredients in these mixtures are not listed by NTP, IARC, ACGIH or OSHA as a carcinogen.

Aspiration hazard No data available.

Human health data See Section 2 - "Other hazards"

SECTION 12 - ECOLOGICAL INFORMATION

Toxicity

Compound	Type	Species	Concentration
Lutetium (III) Chloride	--	--	--
Ammonium Acetate	LC_{50}/48h	Cyprinus carpio	1.06 mg/L
Sodium Azide	LC_{50}/96h	Oncorhynchus mykiss	0.8 mg/L
	LC_{50}/96h	Lepomis macrochirus	0.7 mg/L
	LC_{50}/96h	Pimephales promelas	5.46 mg/L
Diethylenetriaminepentaacetic acid	LC_{50}/96h	Leuciscus idus	>100 mg/L
	EC_{50}/48h	Daphnia	245 mg/L

Persistence and Degradability Polymer component: Diethylenetriaminepentaacetic acid
Biodegradability Biotic/Aerobic – Exposure time 28d
Result: 20 – 60% -- According to the results of tests this product is not readily biodegradable

All other components: No data identified.

Bioaccumulative potential Polymer component: Diethylenetriaminepentaacetic acid
Indication of bioaccumulation.

All other components: No data identified.

Mobility in soil No data identified.

Results of PBT and vPvB assessment Not performed.

Other adverse effects No data identified.

Note The environmental characteristics of this product/mixtures have not been fully investigated. The above data are for the active ingredients and/or any other ingredient(s) where applicable. Although present at low concentrations, disposal should consider that sodium azide is present. Releases to the environment should be avoided.

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste treatment methods	Dispose of wastes in accordance to prescribed federal, state, and local guidelines, e.g., appropriately permitted chemical waste incinerator. Do not send down the drain or flush down the toilet. All wastes containing the material should be properly labeled. Rinse waters resulting from spill cleanups should be discharged in an environmentally safe manner, e.g., appropriately permitted municipal or on- site wastewater treatment facility.

SECTION 14 - TRANSPORT INFORMATION

Transport	Based on the available data, this product/mixture is not regulated as a hazardous material/dangerous good under EU ADR/RID, US DOT, Canada TDG, IATA, or IMDG.
UN number	None assigned.
UN proper shipping name	None assigned.
Transport hazard classes and packing group	None assigned
Environmental hazards	Based on the available data, this product/mixture is not regulated as an environmental hazard or a marine pollutant.
Special precautions for users	Avoid release to the environment. No other special precautions needed.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
Hazardchem Code/HIN	None assigned.

SECTION 15 - REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture	This SDS complies with the requirements under US, EU and GHS (EU CLP - Regulation EC No 1272/2008) guidelines. Consult your local/regional authorities for more information.
Chemical safety assessment	Not conducted.
WHMIS classification	Not classified.
TSCA status	Lutetium (III) chloride is not listed. Ammonium acetate and Sodium azide are listed.
SARA section 313	Sodium azide is listed. All other components: Not listed.
California proposition 65 **Component Analysis – State**	Not listed. Lutetium (III) chloride is not listed. Ammonium acetate is listed as hazardous in CA, HI, MA, NJ, and PA. Sodium azide is listed as hazardous in CA, HI, MA, MN, NJ, PA, RI, VT and WA.
Component Analysis – Chemical Inventory	Lutetium is listed in the chemical inventory of the following countries: Canada, EU, Korea, Taiwan and USA Ammonium acetate is listed in the chemical inventory of the following countries: Australia, Canada, China, EU, Japan, Korea, New Zealand, the Philippines, Taiwan and USA Sodium Azide is listed in the chemical inventory of the following countries: Australia, Canada, China, EU, Japan, Korea, New Zealand, the Philippines and USA

Additional information

No other information identified.

SECTION 16 - OTHER INFORMATION

NFPA Ratings

Lutetium (III) chloride	**Health: 0**	**Fire: 0**	**Reactivity: 0**
Ammonium acetate	**Health: 2**	**Fire: 1**	**Reactivity: 0**
Sodium Azide	**Health: 3**	**Fire: 0**	**Reactivity: 2**
Diethylenetriaminepentaacetic acid	**Health: 2**	**Fire: 1**	**Reactivity: 0**

Sources of data

Information from published literature and internal company data.

Abbreviations

ACGIH - American Conference of Governmental Industrial Hygienists; ADR/RID - European Agreement Concerning the International Carriage of Dangerous Goods by Road/Rail; AIHA - American Industrial Hygiene Association; CA – California; CAS# - Chemical Abstract Services Number; CLP - Classification, Labelling, and Packaging of Substances and Mixtures; DNEL - Derived No Effect Level; DOT - Department of Transportation; EINECS - European Inventory of New and Existing Chemical Substances; ELINCS - European List of Notified Chemical Substances; EU - European Union; GHS - Globally Harmonized System of Classification and Labeling of Chemicals; HI – Hawaii; IARC - International Agency for Research on Cancer; IDLH - Immediately Dangerous to Life or Health; IATA - International Air Transport Association; IMDG - International Maritime Dangerous Goods; LOEL - Lowest Observed Effect Level; LOAEL - Lowest Observed Adverse Effect Level; MA – Massachusetts; NIOSH - The National Institute for Occupational Safety and Health; NJ – New Jersey; NOEL - No Observed Effect Level; NOAEL - No Observed Adverse Effect Level; NTP - National Toxicology Program; OEL - Occupational Exposure Limit; OSHA - Occupational Safety and Health Administration; PA – Pennsylvania; PNEC - Predicted No Effect Concentration; SARA - Superfund Amendments and Reauthorization Act; STEL - Short Term Exposure Limit; TDG - Transportation of Dangerous Goods; TSCA - Toxic Substances Control Act; TWA - Time Weighted Average; US – United States; WHMIS - Workplace Hazardous Materials Information System

Issue Date

22 FEB 2018

Revisions

This is the first version of this SDS.

Disclaimer

The statements contained herein are offered for informational purposes only and are based upon our present state of knowledge. It is applicable to the product with regard to appropriate safety precautions. IONpath Inc. believes them to be accurate at the date of publication but does not purport to be all-inclusive and shall be used only as a guide. The above-stated product is intended for use only by persons having the necessary technical skills and facilities for handling the product at their discretion and risk. Since conditions and manner of use are outside our control, we (IONpath Inc.) make no warranty of merchantability or any such warranty, express or implied with respect to information and we assume no liability resulting from the above product or its use. Users should perform their own investigations to determine suitability of information and product for their particular purposes.