Nessler's reagent

sc-253185

Material Safety Data Sheet

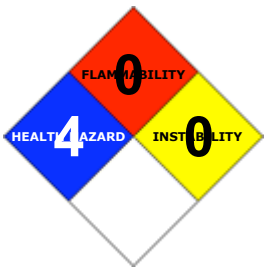
Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Nessler's reagent

STATEMENT OF HAZARDOUS NATURE
CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER
Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800
EMERGENCY:
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS
K2-Hg-I4, "Channings Solution", "Nessler Reagent", "mercurate (2-), tetraiodo-, dipotassium", "mercuric potassium iodide", "solution potassium iodohydragyrate"

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability:	0		
Toxicity:	4		
Body Contact:	4		
Reactivity:	0		
Chronic:	2		

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4

CANADIAN WHMIS SYMBOLS

EMERGENCY OVERVIEW

RISK

Danger of cumulative effects.
Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
Very toxic by inhalation, in contact with skin and if swallowed.
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Severely toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 5 gram may be fatal or may produce serious damage to the health of the individual.
■ Symptoms of ingestion within the first few minutes may include pain, profuse vomiting and severe purging and the victim may die within a few hours from peripheral vascular collapse secondary to fluid and electrolyte loss. Primary gastroenteritis may subside spontaneously within a few days but severe hemorrhagic inflammation of the colon (colitis) has occurred as late as 9 days following ingestion.<\div>.

EYE

■ Although the material is not thought to be an irritant, direct contact with the eye may cause transient discomfort characterized by tearing or conjunctival redness (as with windburn). Slight abrasive damage may also result.
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SKIN

■ Skin contact with the material may produce severely toxic effects; systemic effects may result following absorption and these may be fatal.
■ The material is not thought to be a skin irritant (as classified using animal models). Abrasive damage however, may result from prolonged exposures.
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■ Reactions may not occur on exposure but response may be delayed with symptoms only appearing many hours later.
■ Open cuts, abraded or irritated skin should not be exposed to this material.
■ Solution of material in moisture on the skin, or perspiration, mayincrease irritant effects.
■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

■ Inhalation of dusts, generated by the material, during the course of normal handling, may produce severely toxic effects; these may be fatal.
■ The material is not thought to produce respiratory irritation (as classified using animal models). Nevertheless inhalation of dusts, or fume, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.
■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
■ If any of these symptoms are noticed, CEASE work immediately and seek medical attention or call a doctor.

CHRONIC HEALTH EFFECTS

■ Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
Harmful: danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.
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There is limited evidence that, skin contact with this product is more likely to cause a sensitization reaction in some persons compared to the general population.
Exposure to the material may cause concerns for humans owing to possible developmental toxic effects, on the basis that similar materials tested in appropriate animal studies provide some suspicion of developmental toxicity in the absence of signs of marked maternal toxicity, or at around the same dose levels as other toxic effects but which are not a secondary non-specific consequence of other toxic effects.
Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.
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Iodine and iodides, may give rise to local allergic reactions such as hives, rupture of skin blood vessels, pain in joints or diseases of the lymph nodes.
Iodine and iodides cause goiter and diminished as well as increased activity of the thyroid gland. A toxic syndrome resulting from chronic iodide overdose and from repeated administration of small amounts of iodine is characterized by excessive saliva production, head cold, sneezing, conjunctivitis, headache, fever, laryngitis, inflammation of the bronchi and mouth cavity, inflamed parotid gland, and various skin rashes.
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Mercury easily crosses the placenta and causes birth defects. Chronic exposure results in excess saliva production, loss of appetite, stomach upset, vague abdominal discomfort and mild diarrhea.
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BE AWARE: Repeated minor exposures with only mild symptoms may have serious cumulative poisoning effect.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
potassium tetraiodomercurate(II)	7783-33-7	98

Section 4 - FIRST AID MEASURES

SWALLOWED
· IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY. · Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:

EYE
■ If this product comes in contact with the eyes: · Immediately hold eyelids apart and flush the eye continuously with running water. · Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN
■ If skin or hair contact occurs: · Immediately flush body and clothes with large amounts of water, using safety shower if available. · Quickly remove all contaminated clothing, including footwear.

INHALED
· If fumes or combustion products are inhaled remove from contaminated area. · Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN
· Moderate adsorption of inorganic mercury compounds through the gastro-intestinal tract (7-15%) is the principal cause of poisoning. These compounds are highly concentrated (as the mercuric (Hg (2+) form) in the kidney; acute ingestion may lead to oliguric renal failure. Severe mucosal necrosis may also result from ingestion.
· Chronic effects range from proteinuria to nephrotic syndrome. Chronic presentation also involves dermatitis, gingivitis, stomatitis, tremor and neuropsychiatric symptoms of erethism.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Negligible
Upper Explosive Limit (%):	Not applicable
Specific Gravity (water=1):	Not available
Lower Explosive Limit (%):	Not applicable

EXTINGUISHING MEDIA
· Water spray or fog.
· Foam.

FIRE FIGHTING
· Alert Emergency Responders and tell them location and nature of hazard.
· Wear full body protective clothing with breathing apparatus.
When any large container (including road and rail tankers) is involved in a fire,
consider evacuation by 800 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS
· Non combustible.
· Not considered to be a significant fire risk, however containers may burn.
Decomposition may produce toxic fumes of: hydrogen iodide, metal oxides.
May emit poisonous fumes.

FIRE INCOMPATIBILITY
■ None known.

PERSONAL PROTECTION
Glasses:
Full face- shield.
Gloves:
Respirator:
Particulate

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS
· Clean up waste regularly and abnormal spills immediately.
· Avoid breathing dust and contact with skin and eyes.
· Wear protective clothing, gloves, safety glasses and dust respirator.
· Use dry clean up procedures and avoid generating dust.
· Vacuum up or sweep up. NOTE: Vacuum cleaner must be fitted with an exhaust micro filter (HEPA type) (consider explosion-proof machines designed to be grounded during storage and use).

· Dampen with water to prevent dusting before sweeping.
· Place in suitable containers for disposal.
MAJOR SPILLS
· Clear area of personnel and move upwind.
· Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING
· Avoid all personal contact, including inhalation.
· Wear protective clothing when risk of exposure occurs.

RECOMMENDED STORAGE METHODS
■ Glass container.
· Lined metal can, Lined metal pail/drum
· Plastic pail.
For low viscosity materials
· Drums and jerricans must be of the non-removable head type.
· Where a can is to be used as an inner package, the can must have a screwed enclosure.
All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.

STORAGE REQUIREMENTS
· Store in original containers.
· Keep containers securely sealed.
Light sensitive.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak mg/m³	Notes
US - Hawaii Air Contaminant Limits	potassium tetraiodomercurate(II) (Mercury (vapor) (as Hg))		0.05				
US - California Permissible Exposure Limits for Chemical Contaminants	potassium tetraiodomercurate(II) (Mercury, metallic and inorganic compounds as Hg)		0.025			0.1	
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	potassium tetraiodomercurate(II) (Mercury, (as Hg): Inorganic forms, including metallic mercury)		0.025		0.075		Skin
Canada - Nova Scotia Occupational Exposure Limits	potassium tetraiodomercurate(II) (Mercury - Inorganic compounds (as Hg))		0.025				TLV Basis: central nervous system impairment; kidney damage
Canada - Alberta Occupational Exposure Limits	potassium tetraiodomercurate(II) (Mercury, as Hg in Inorganic compounds, including metallic mercury)		0.025				
US - Idaho - Limits for Air Contaminants	potassium tetraiodomercurate(II) (Mercury (aryl and inorganic) (as Hg))		[2]				
US - Minnesota Permissible Exposure Limits (PELs)	potassium tetraiodomercurate(II) (Mercury (aryl and inorganic) (as Hg))					0.1	

US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	potassium tetraiodomercurate(II) (Mercury (aryl and inorganic) (as Hg))					0.1	
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	potassium tetraiodomercurate(II) (Mercury (aryl and inorganic) (as Hg))					0.1	
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	potassium tetraiodomercurate(II) (Mercury (aryl and inorganic)(as Hg))		See Table Z-2				
US - Hawaii Air Contaminant Limits	potassium tetraiodomercurate(II) (Mercury (aryl and inorganic) (as Hg))					0.1	
US - Washington Permissible exposure limits of air contaminants	potassium tetraiodomercurate(II) (Mercury (as Hg) - Aryl and inorganic)		0.1		0.3		
US - Alaska Limits for Air Contaminants	potassium tetraiodomercurate(II) (Mercury (aryl and inorganic) (as Hg))					0.1	
US - Michigan Exposure Limits for Air Contaminants	potassium tetraiodomercurate(II) (Mercury inorganic and aryl compouns (As Hg))					0.1	
US ACGIH Threshold Limit Values (TLV)	potassium tetraiodomercurate(II) (Mercury - Inorganic compounds (as Hg))		0.025				TLV Basis: central nervous system impairment; kidney damage
Canada - British Columbia Occupational Exposure Limits	potassium tetraiodomercurate(II) (Mercury - Inorganic compounds, as Hg)		0.025				Skin; R
Canada - Prince Edward Island Occupational Exposure Limits	potassium tetraiodomercurate(II) (Mercury - Inorganic compounds (as Hg))		0.025				TLV Basis: central nervous system impairment; kidney damage
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	potassium tetraiodomercurate(II) (Mercury, inorganic compounds (as Hg))		0.025				
US NIOSH Recommended Exposure Limits (RELs)	potassium tetraiodomercurate(II) (Mercury compounds [except (organo) alkyls] (as Hg))		0.05			0.1	[skin]; (TWA (Hg Vapor)); (Ceiling (Other))
Canada - Ontario Occupational Exposure Limits	potassium tetraiodomercurate(II) (Mercury - All forms of except alkyl (as mercury))		0.025				Skin
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	potassium tetraiodomercurate(II) (Mercury (all forms except Alkyl) (as Hg))	-	0.05	-	0.15		

Canada - Northwest Territories Occupational Exposure Limits (English)	potassium tetraiodomercurate(II) (Mercury (all forms except Alkyl) (as Hg))	0.05	0.15

ENDOELTABLE

PERSONAL PROTECTION




RESPIRATOR

Particulate
Consult your EHS staff for recommendations

EYE

· Chemical goggles.
· Full face shield.

HANDS/FEET

■ Elbow length PVC gloves.
NOTE: The material may produce skin sensitization in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.
Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:
· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity
Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).
· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
· Contaminated gloves should be replaced.
Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

OTHER

· Overalls.
· Eyewash unit.

ENGINEERING CONTROLS

■ Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator.
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Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Solid.
Mixes with water.

State	Divided solid	Molecular Weight	786.39
Melting Range (°F)	Not available	Viscosity	Not Applicable
Boiling Range (°F)	Not available	Solubility in water (g/L)	Miscible
Flash Point (°F)	Not applicable	pH (1% solution)	Not available
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not applicable	Vapour Pressure (mmHG)	Negligible
Upper Explosive Limit (%)	Not applicable	Specific Gravity (water=1)	Not available
Lower Explosive Limit (%)	Not applicable	Relative Vapor Density (air=1)	Not applicable
Volatile Component (%vol)	Negligible	Evaporation Rate	Not applicable

APPEARANCE

Sulfur yellow deliquescent crystals; mix with water, alcohol, ether, acetone.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

· Presence of incompatible materials.
· Product is considered stable.

STORAGE INCOMPATIBILITY

· WARNING: Avoid or control reaction with peroxides. All transition metal peroxides should be considered as potentially explosive. For example transition metal complexes of alkyl hydroperoxides may decompose explosively.
· The pi-complexes formed between chromium(0), vanadium(0) and other transition metals (haloarene-metal complexes) and mono-or poly-fluorobenzene show extreme sensitivity to heat and are explosive.
· Avoid reaction with borohydrides or cyanoborohydrides.
· Metals and their oxides or salts may react violently with chlorine trifluoride and bromine trifluoride.
· These trifluorides are hypergolic oxidisers. They ignites on contact (without external source of heat or ignition) with recognised fuels - contact with these materials, following an ambient or slightly elevated temperature, is often violent and may produce ignition.
· The state of subdivision may affect the results.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTASSIUM TETRAIODOMERCURATE(II)

TOXICITY AND IRRITATION

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Dermal (guinea pig) LDLo: 1000 mg/kg	Nil Reported

CARCINOGEN

MERCURY COMPOUNDS	US Environmental Defense Scorecard Suspected Carcinogens	Reference(s)	P65-MC

SKIN

potassium tetraiodomercurate(II)	US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants - Skin	Skin Designation	X
potassium tetraiodomercurate(II)	US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants - Skin	Skin Designation	X
potassium tetraiodomercurate(II)	US - Washington Permissible exposure limits of air contaminants - Skin	Skin	X
potassium tetraiodomercurate(II)	US - Minnesota Permissible Exposure Limits (PELs) - Skin	Skin Designation	X
potassium tetraiodomercurate(II)	US - Hawaii Air Contaminant Limits - Skin Designation	Skin Designation	X
potassium tetraiodomercurate(II)	US OSHA Permissible Exposure Levels (PELs) - Skin	Skin Designation	X
potassium tetraiodomercurate(II)	Canada - Alberta Occupational Exposure Limits - Skin	Substance Interaction	1

Section 12 - ECOLOGICAL INFORMATION

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
This material and its container must be disposed of as hazardous waste.
Avoid release to the environment.
Refer to special instructions/ safety data sheets.

Section 13 - DISPOSAL CONSIDERATIONS

US EPA Waste Number & Descriptions

A. General Product Information
Toxicity characteristic: use EPA hazardous waste number D009 (waste code E) if this substance, in a solid waste, produces an extract containing greater than 0.2 mg/L of mercury.

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.
¦ Puncture containers to prevent re-use and bury at an authorized landfill.
Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:
· Reduction
· Reuse
· Recycling
· Disposal (if all else fails)
This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.
DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.
· Recycle wherever possible or consult manufacturer for recycling options.
· Consult Waste Management Authority for disposal.

Section 14 - TRANSPORTATION INFORMATION

DOT:
Symbols: None Hazard class or Division: 6.1
Identification Numbers: UN1643 PG: II
Label Codes: 6.1 Special provisions: IB8, IP2,
IP4, T3,
TP33
Packaging: Exceptions: 153 Packaging: Non- bulk: 212
Packaging: Exceptions: 153 Quantity limitations: 25 kg
Passenger aircraft/rail:
Quantity Limitations: Cargo 100 kg Vessel stowage: Location: A
aircraft only:
Vessel stowage: Other: None S.M.P.: Severe
Hazardous materials descriptions and proper shipping names:
Mercury potassium iodide

Air Transport IATA:

ICAO/IATA Class: 6.1 ICAO/IATA Subrisk: None
UN/ID Number: 1643 Packing Group: II
Special provisions: None
Cargo Only
Packing Instructions: 615 Maximum Qty/Pack: 100 kg
Passenger and Cargo Passenger and Cargo
Packing Instructions: 613 Maximum Qty/Pack: 25 kg
Passenger and Cargo Limited Quantity Passenger and Cargo Limited Quantity
Packing Instructions: Y613 Maximum Qty/Pack: 1 kg
Shipping Name: MERCURY POTASSIUM IODIDE

Maritime Transport IMDG:

IMDG Class: 6.1 IMDG Subrisk: P
UN Number: 1643 Packing Group: II
EMS Number: F-A , S-A Special provisions: None
Limited Quantities: 500 g Marine Pollutant: Yes
Shipping Name: MERCURY POTASSIUM IODIDE

Section 15 - REGULATORY INFORMATION

REGULATIONS

potassium tetraiodomercurate(II) (CAS: 7783-33-7) is found on the following regulatory lists;
"Canada - Saskatchewan Environmental Persistent or Chronic Hazardous Substances","Canada Domestic Substances List (DSL)","US Department of Transportation (DOT) Marine Pollutants - Appendix B","US Toxic Substances Control Act (TSCA) - Inventory"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

■ Possible skin sensitiser*.
■ May possibly be harmful to the foetus/ embryo*.
* (limited evidence).

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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