

SECTION I - PRODUCT IDENTIFICATION

Product name: D-Phenylalanyl-L-Pipecolyl-p-nitroaniline dihydrochloride
Manufacturer: INterface BIOmaterials B.V
Synonyms: CBS-2238, S-2238

SECTION II - COMPOSITION/INFORMATION ON COMPONENTS

H-D-Phe-Pip-Arg-pNA.2HCl is a peptide bound to p-nitroaniline (pNA). Synonyms: 4-Nitroaniline, p-aminonitrobenzene. **CAS No:** 100-01-6. **Molecular Weight:** 138.13 g.mol-1. **Hazard Classification:** T. **Risk Code:** R23/24/25-33-52/53. **R23/24/25:** Toxic by inhalation in contact with skin and if swallowed. **R33:** Danger of cumulative effect. **R52/53:** Harmful to aquatic organism, may cause long-term adverse effects in the aquatic environment. **Safety Code:** S28-36/37-45-61.

Ingredient	CAS#	Hazardous
H-D-Phe-Pip-Arg-pNA.2HCl	NA	
Mannitol	69-65-8	
p-nitroaniline (pNA)	100-01-6	Yes

SECTION III - HAZARD IDENTIFICATION

Emergency Overview: POISON DANGER! HAZARDOUS SOLID AND DUST. HIGHLY TOXIC. RAPIDLY ABSORBED THROUGH SKIN. CAUSES METHEMOGLOBINEMIA, DECREASING OXYGEN IN BLOOD. COMBUSTIBLE DUST - EXPLOSION POTENTIAL. MAY BE FATAL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN. HANDLE IN FUME HOOD. **Target Organs:** Lungs, heart, blood, liver. **Health Rating:** 3 - Severe (Life). **Flammability Rating:** 1 - Slight. **Reactivity Rating:** 1 - Slight. **Contact Rating:** 3 - Severe (Life). Lab Protective Equipment: GOGGLES, LAB COAT, VENT HOOD, PROPER GLOVES. **Storage Color Code:** Blue (Health).

Effects of Exposure: Inhalation and skin contact are expected to be the primary routes of occupational exposure to p-nitroaniline. p-Nitroaniline is readily absorbed through human skin. Although p-nitroaniline is considered to be only slightly toxic on the basis of single exposure by animal tests, human experience has shown that man is much more sensitive to methemoglobinemia, caused by aromatic amino compounds, than the rat or the rabbit. Methemoglobinemia is a condition caused by changes in the blood cells, which decrease the oxygen-carrying capacity of the blood. Cyanosis may occur and, as oxygen deficiency increases, there may be associated headache, weakness, irritability, drowsiness, shortness of breath, and unconsciousness. The appearance of methemoglobinemia may be delayed 0 to 12 hours after exposure. Because of the high potential for this material to cause methemoglobin formation, p-nitroaniline should be considered **HAZARDOUS** by all routes of exposure and exposures should be tightly controlled.

Inhalation: Headache, coughing, dizziness, difficult breathing, nausea, vomiting, increased heart rate, cyanosis, and unconsciousness. **Ingestion:** Nausea, vomiting, increased heart rate, methemoglobinemia, cyanosis, (bluish discoloration of the skin). **Skin Contact:** Not a skin irritant may be absorbed through the skin with possible systemic effect. **Eye Contact:** Slight irritation with discomfort, tearing, blurring of vision. **Chronic Exposure:** Liver damage, kidney damage, bone marrow damage, blood damage. **Aggravation of pre-existing Conditions:** Liver disorders.

SECTION IV - FIRST AID MEASURES

Inhalation: If inhaled remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Prompt action is essential. **Ingestion:** Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention. **Skin Contact:** Immediately remove contaminated clothing and wash affected area thoroughly with soap and water. **Eye Contact:** In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

Note to physician: Absorption of this product into the body may lead to the formation of methemoglobin that, in sufficient concentration, causes cyanosis. Since reversion of methemoglobin to hemoglobin occurs spontaneously after termination of exposure, moderate degrees of cyanosis need to be treated only by supportive measures such as bed rest and oxygen inhalation. Thorough cleaning of the entire contaminated areas of the body, including scalp and nails, is of utmost importance. If cyanosis is severe, intravenous injection of methylene blue, one milligram per kilogram of body weight, may be of value. Cyanocobalamin (Vitamin B12), one milligram intramuscularly, may speed recovery. Intravenous fluids and blood transfusions may be indicated in very severe exposure.

SECTION V – FIRE FIGHTING MEASURES

Fire: Flash point: 199 °C (390 °F) CC. **Explosion:** Combustible dust. This material, like most organic materials in powder form, is capable of creating a dust explosion. Refer to NFPA pamphlet No.654. “Standard for the prevention of fire and dust explosions in the chemical, dye, pharmaceutical and plastic industries” if the material is to be reduced to or collected as a powder. Sensitive to static discharge. **Fire Extinguishing Media:** Water, dry chemical, foam or carbon dioxide. **Special Information:** Firefighters should wear proper protective equipment and self-contained breathing apparatus with full-face piece operated in positive pressure mode. Fire fighting equipment should be thoroughly decontaminated after use. This material, as normally packaged and handled, can contain sufficient fines to present a potential dust explosion hazard if a sufficient quantity of this material is dispersed in air.

SECTION VI – ACCIDENTAL RELEASE MEASURES

Wear self-contained breathing apparatus and full protective clothing. With clean shovel, carefully place material into clean, dry container and cover; remove from area. Flush spill area with water. Ventilate area.

SECTION VII – HANDLING AND STORAGE

Store in a cool place away from heated areas, sparks and flame. Store in a well ventilated area. Store away from incompatible materials. Keep containers tightly closed and dry. Avoid contact with skin and eyes. Avoid dust formation. Protect from freezing. Use only in a chemical fume hood. Do not breathe dust. Do not get in eyes, on skin, or on clothing. Avoiding prolonged or repeated exposure. Wash thoroughly after handling. Keep it dry. Moisture causes nitration of organic materials and may result in spontaneous ignition. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product. **Precautions:** Avoid contact with skin and eye and prolonged exposure. The product is stable until the expiration date shown on the box and on the labels when stored at 2 – 8 °C. **Work/Hygienic Practices:** Wash hands with soap and water after use.

SECTION VIII – EXPOSURE CONTROL/PERSONAL PROTECTION

Airborne Exposure Limits: -OSHA Permissible Exposure Limit (PEL): 1 ppm (TWA). The PEL listed denotes PEL (skin. –ACGIH Threshold Limit Value (TLV): 3 mg.m⁻³ (TWA). The TLV listed denotes TLV (skin). **Ventilation System:** A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. **Personal respirators (NIOSH Approved):** For conditions of use where exposure to the substance is apparent and engineering controls are not feasible, consult an industrial hygienist. For emergencies, or instances where the exposure levels are not known, use a full-face piece positive- pressure, air-supplied respirator. **WARNING:** Air purifying respirators do not protect workers in oxygen-deficient atmospheres. **Skin Protection:** Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. **Eye Protection:** Use chemical safety goggles and/or full-face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Yellow powder. **Odor:** Faint amine odor. **Solubility:** Negligible (< 0.1%). **Specific Gravity:** 1. **Percent Volatiles by volume at 21 °C (70 °F):** 0. **Boiling Point:** 332 °C (630 °F). **Melting Point:** 149 °C (300 °F). **Vapor Density (Air = 1):** 4.77. **Vapor Pressure (mm Hg):** Not applicable. **Appearance:** lyophilized powder. **Color:** Slightly yellow.

SECTION X – STABILITY AND REACTIVITY

Stability: Stable under ordinary conditions of use and storage. **Hazardous Decomposition Products:** Carbon monoxide, carbon dioxide, oxides of nitrogen. **Hazardous Polymerization:** Will not occur. **Incompatibilities:** Strong oxidizing agents, strong acids, strong reducing agents, strong bases, alcohols, ketones, aldehydes. **Conditions to Avoid:** Heat, flame, other sources of ignition, moisture.

SECTION XI – TOXICOLOGICAL INFORMATION

Reproductive Toxicity: The compound does produce genetic damage in bacterial cell cultures but does not produce genetic damage in animals. It does not produce heritable genetic damage.

SECTION XII – ECOLOGICAL INFORMATION

Environmental Fate: No information found. **Environmental Toxicity:** Daphnia Magna: 48 Hr-LC50 = 20 – 30 ppm, slightly toxic. Rainbow Trout: 96 Hr-LC50 = 45 ppm, slightly toxic. Bluegill Sunfish: 96 Hr-LC50 = 80 ppm, slightly toxic.

SECTION XIII – DISPOSAL CONSIDERATIONS

Whatever cannot be saved from recovery or recycling should be handled as hazardous waste and set to a RCRA approved waste facility. Insure compliance with all government regulations.

SECTION XIV – TRANSPORT INFORMATION

Proper Shipping Name (pNA as raw material): Nitrosalines. **Hazard Class:** 6.1. **UN/NA:** UN 1661. **Packaging Group:** II. **Information reported for product/size:** 100 g

SECTION XV – REGULATORY INFORMATION FOR pNA

Chemical Inventory Status – Part 1:

TSCA: Yes EC: Yes Japan: Yes Australia: Yes

Federal, State & International Regulations – Part 1:

SARA 302 RQ: No TPQ: No SARA 313 List: No Chemical Catg: No

Federal, State & International Regulations – Part 2:

CERCLA: No RCRA 261.33: No TSCA 8(d): No

Chemical Weapons Convention:

TSCA 12(b): No CDTA: No SARA 311/312 Acute: Yes Chronic: No
Fire: No Pressure: No Reactivity: No (Pure/Solid)

Australian Hazchem Code: 2X. Poison Schedule: None allocated. WHMIS: This MSDS has been prepared according to the hazard criteria of the Controlled Product Regulations (CPR) and the MSDS contains all of the information required by the CPR.

Chemical Inventory Status: Toxic Substances Control Act (TSCA): Yes. Canadian Domestic Substances List (DSL): Yes. European Inventory of Existing Commercial Chemical Substances (EINECS/ELINCS): Yes.

Federal, State and International Regulations:

SARA 302 SARA 313 RCRA TSCA

Ingredient	RQ	TPQ	List	Category	CERCLA	261.33	8(D)
Isopropyl Alcohol	No	No	Yes	No	No P077	Yes	
Chemical Weapons Convention:		No	TSCA 12(b): No		CDTA: No		
SARA 311/312: Acute: Yes	Chronic: Yes		Fire: No		Pressure: No	Reactivity: Yes	

To the best of our knowledge the information contained herein is correct. Users of any product should satisfy themselves that the conditions and methods of use assure that the product is used safely. No representations or warranties, either express or implied, of merchantability, fitness for a particular purpose or any other nature are made hereunder with respect to the information contained herein or the product to which the information refers. Nothing herein is intended as a recommendation to use any product so as to infringe any patent. We assume no liability for customer's violation of a patent or other rights. The customer should make his own patent investigation relative to a proposed use.