Safety Data Sheet

For Compliance with OSHA 29 CFR 1910.1200 and ANSI Z400.1-1998

Section 1: Identification

Product Name Nifedipine USP Micronized
Commercial Name Nifedipine
Product Use Manufacture of fine chemicals [SU9]; Pharmaceuticals [PC29]; Active Pharmaceutical Ingredient
Restrictions On Use not suitable for relief of an acute attack; and in the treatment of Raynaud' s syndrome.

Product Code 55-5205

Company
PCCA
9901 South Wilcrest
Houston, TX 77099
Phone: 1-800-331-2498
Fax: 1-800-874-5760

In case of emergency contact:
CHEMTREC (24hr) 1-800-424-9300

Section 2: Hazard(s) Identification

OSHA Haz Com: CFR 1910.1200 Acute Tox. 4; H302 STOT SE 1; H370 STOT RE 1; H372

Signal Word DANGER

Hazard Statement(s) H302 Harmful if swallowed. H370 Causes damage to cardiovascular system orally. H372 Causes damage to cardiovascular system, skin, multiple systemic effects through prolonged or repeated exposure orally.

Pictogram(s) or Symbol(s)

Precautionary Statement(s):

Prevention P264 Wash hands and face thoroughly after handling. P270 Do not eat, drink or smoke when using this product

Response P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. P330 Rinse mouth.

Storage n/a

Disposal n/a

Section 3: Composition/Information on Ingredients

Substance/Mixture Substance
Components Nifedipine
% By Weight >=99.7
CAS# 21829- 25- 4
Molecular Weight 346.335
Chemical Formula C17H18N2O6
Synonym(s) n/a

Mixtures

Name	CAS#	% by Weight	TLV/PEL	LC50/LD50
Nifedipine	21829- 25- 4	>=99.7	N/A	N/A

Section 4: First-Aid Measures

Inhalation Move the person to fresh air. In the case of respiratory symptoms (cough, dyspnea) place the person in a semi-seated position and administer oxygen. Provide artificial respiration if the person is not breathing.

Skin Contact Flush the skin with copious amounts of water (and soap, if possible) for at least 15 minutes. Consult a physician if there are symptoms of skin irritation and/ or pain

Eye Contact Remove contact lenses, if present and easy to do. Flush the eyes, kept open, with copious amounts of running water for at least 15 minutes. Consult a physician, especially if there are symptoms of eye irritation and/ or pain.

Ingestion Do not induce emesis. Do not administer anything by mouth unless advised to do so by a poison control center. Rinse the mouth and consult a physician.

Symptoms/Effects

Acute Most important symptoms and effects, both acute and delayed, are described in section 11

Delayed Most important symptoms and effects, both acute and delayed, are described in section 11

Immediate Medical Attention

If the victim has severe symptoms, immediately call your local health care emergency number to request the intervention of a physician. Refer to each case a poison control center for advice and medical toxicology specialist from the early stages of the rescue. Consult a physician if in any case any symptoms, even mild, persists.

Section 5: Fire-Fighting Measures

Suitable Extinguishing Media

As the substance is a solid material, the most suitable extinguishing media are water and dry chemicals (powders); foam and carbon dioxide are less effective. In the choice of extinguishing media, consider the other materials involved in the fire.

Unsuitable Extinguishing Media

n/a

Products of Combustion

carbon oxides (COx), nitrogen oxides (NOx)

Firefighters Special Equipment and Precautions

Hardhat with visor, fireproof clothing (fireproof jacket and trousers with straps around arms, legs and waist), work gloves (fireproof, cut proof kbriscoand dielectric), a depressurized mask with facemask covering the whole of the operator` s face or a self- respirator (self- protector) in the event of large quantities of fume

Section 6: Accidental Release Measures

For non- emergency personnel a) eliminate sources of ignition (cigarettes, flames, sparks, etc.) from the area in which the leak occurred; b) send away individuals who are not suitably equipped. For emergency responders a) do not handle damaged containers or leaked product before donning appropriate protective gear (Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing; b) if there are no contraindications, spray powder with water to prevent the formation of dust and provide sufficient ventilation. Environmental precautions The product must not penetrate the sewer system, surface water, ground water and neighboring areas. Methods and material for containment and cleaning up Appropriate advice on how to contain a spill a) make sure the leakage site is well aired. Appropriate advice on how to clean up a spill a) use spark proof mechanical tools to collect the leaked product and place in a plastic container; b) if there are no contraindications, use jets of water to eliminate product residues. Any other information relating to spills and releases, including advice on inappropriate containment or clean up techniques a) contaminated material should be disposed of in compliance with the provisions set forth in point 13. Reference to other sections For any other information on risks for the environment (Section 12) and health (Section 11), on personal protection (Section 8) and disposal Section 13), see the other sections of this sheet.

Section 7: Handling and Storage

Protective measure Measures to prevent fire a) eliminate sources of ignition (cigarettes, flames, sparks, etc.); b) wear antistatic cloths and shoes when handling this substance; c) use antistatic primary packaging; d) avoid shaking the powder or creating dust clouds; e) ground and bound equipment; work as much as possible with inertization systems to avoid the formation of potentially explosive atmospheres; f) use spark proof mechanical tools to collect the leaked product. Measures to prevent aerosol and dust generation a) avoid shaking packaging when filling/empting them; b) keep containers tightly sealed when not in use. Measures to protect the environment a) general ventilation; b) LEV; c) filters or water scrubbers on exhaust ventilation. Advice on general occupational hygiene a) not to eat, drink and smoke in work areas; b) to wash hands after use; c) to remove contaminated clothing and protective equipment before entering eating areas. Conditions for safe storage, including any incompatibilities Technical measures and storage conditions Store away from incompatible materials (Section 10). The substance should be stored in a manner to prevent degradation, contamination, and cross- contamination, keeping material in properly labeled tightly closed containers. The substance stored in plastic drums should be stored off the floor and suitably spaced to permit cleaning and inspection. Packaging materials Double antistatic polythene bag (inner packaging); plastic (outer packaging). Requirements for storage rooms and vessels There should not be present sources of ignition (cigarettes, flames, sparks, etc.). Specific end use(s) The substance is an Active Pharmaceutical Ingredient whose use is under relevant regulations and specific guidelines (such as EudraLex Volume 4 " The rules governing medicinal products in the European Union" containing guidance for the interpretation of the principles and guidelines of good manufacturing practices for medicinal products for human and veterinary use) of the pharmaceuticals industrial sector.

Section 8: Exposure Controls/Personal Protection

Exposure Limits

Limit Value-Eight Hours; 6 µg/m^3 The substance has not a national occupational exposure limit value that corresponds to a Community OEL or a relevant national limit and an Indicative Occupational Exposure Limit Value (IOELV) has not been proposed by the European Commission not yet been transposed into individual Member States national law. The reported limit value is obtained applying a calculation model that includes the following three levels approaches: Level I – calculation based on Therapeutic Dose approach Level II – calculation based on " banding approach" Level III – calculation based on NOAEL or LOAEL approach Information on monitoring procedures The main currently recommended monitoring (air monitoring, room air monitoring) are: UNI EN 481 Workplace atmospheres. Size fraction definitions for measurement of airborne particles. UNI EN 482 Workplace atmospheres. General requirements for the performance of procedures of chemical agents. UNI EN 689 Workplace Atmosphere – Guide to assessing inhalation exposure to chemical compounds with the purpose of comparing them to the limit values and measuring strategies. UNI EN 1232 Workplace atmospheres - Pumps for personal sampling of chemical agents. Requirements and test methods. UNI EN 1540 Workplace Atmosphere. Terminology.

Engineering Controls

Appropriate engineering controls When handling the substance in laboratory (i.e. small quantities), use a fume hood. For manufacturing and pilot plant operations: charge/discharge equipment under nitrogen purging, and convey emissions to abatement systems ; use process enclosures, containment technology, or other engineering controls to keep airborne levels below recommended exposure limit (e.g., barrier/containment technology and direct coupling, hybrid unidirectional airflow/local exhaust ventilation solutions, etc.); ensure that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area; all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this substance are bonded and grounded and/or contain explosion relief vents or an explosion suppression system or an oxygen deficient environment or equivalent; use of HEPA filter for filtration of exhaust from dry product handling areas is preferred; use only appropriately classified electrical equipment and powered industrial trucks

Personal Protection

Eye/ face protection: full face mask (EN 136; EN 148- 1). b) Skin protection i) Hand protection: natural rubber gloves (EN 374- 1). ii) Other: professional disposable overall with hood for use with chemicals (EN ISO 13982; EN 1149- 1). c) Respiratory protection: full mask with P3 filter (EN 14387). These protection measures are aimed to prevent: negative effects on health of the personnel handling this substance due to both health hazards of the substance and its pharmacological activity; contamination of the substance due to biological material (such as, hair, skin cells, droplets of saliva, etc.) from the human body.

Section 9: Physical and Chemical Properties

Appearance	Yellow Crystalline Powder
Odor	No information available.
Odor Threshold	No information available.

Melting Point	172÷174°C	**pH**	No information available.
Freezing Point	172÷174°C	**Vapor Pressure**	2.63x10- 8 mmHg @ 25
Boiling Point/Range	439.94°C	**Vapor Density**	No information available.
Decomposition temperature	No information available.	**Viscosity**	Not relevant information because t
Partition Coefficient: n-octanol/water	2.20	**Evaporation Rate**	No information available.
Flash Point	Not relevant information bec	**Autoignition temperature**	No information available.
Flammability	No information available.	**Flammability or Explosive Limits:**	
		Lower	See Subsection 9.2
		Upper	See Subsection 9.2

Solubility(ies)	ies): Freely soluble in Acetone; sparingly soluble in Ethanol; practically insoluble in water;CTD]. Solubility at 20° C (g/ L): acetone 250, methylene chloride 160, chloroform 140, ethyl acetate 50, methanol 26, ethanol 17
Other	n/a

Section 10: Stability and Reactivity

Reactivity	There are no particular risks of reaction with other substances in normal conditions of use.
Chemical Stability	Nifedipine subjected to stress conditions (Base pH conditions: 0.1 N NaOH, at increasing temperatures at slight reflux under stirring; Acid pH conditions: 0.1 N HCl at increasing temperatures at slight reflux under stirring) was found to be stable only at low temperature while with the increase of temperature it degraded as well as in oxidation conditions (H2O2 20 volumes at room temperature for 60 minutes, then at increasing temperature) at all temperatures. In the presence of elevated temperature (105° C in oven for 7 days) it denoted an excellent chemical stability while the product was extremely sensitive to exposure to both daylight (4 hours) and UV light (24 hours)
Hazardous Polymerization	There are no particular hazardous reaction in normal conditions of use.
Conditions to Avoid	As a precautionary measure, avoid dust generation and keep away from source of ignition like heat sources or electrostatic discharges. Avoid exposure to light.
Incompatible Materials	Keep away from oxidizing agents and hot bases and acids.
Hazardous Decomposition Products	arbon oxides (COx), nitrogen oxides (NOx).

Section 11: Toxicological Information

RTECS n/a

Acute Toxicity

Acute Toxicity-Oral Rat LD50 oral 1022 mg/ kg 1022 mg/ kg) BEHAVIORAL: CHANGES IN MOTOR ACTIVITY SPECIFIC ASSAY) LUNGS, THORAX, OR RESPIRATION: RESPIRATORY STIMULATION LUNGS, THORAX, OR RESPIRATION: DYSPNEA

Skin Corrosion/Irritation

No data on this property were found in literature. Therefore, the substance is not classified for this hazard because of data lacking

Serious Eye Damage/Irritation

No data on this property were found in literature. Therefore, the substance is not classified for this hazard because of data lacking

Respiratory or Skin Sensitization

No data on this property were found in literature. Therefore, the substance is not classified for this hazard because of data lacking

Germ Cell Mutagenicity
No data on this property were found in literature. Therefore, the substance is not classified for this hazard because of data lacking

Carcinogenicity
No data on this property were found in literature. Therefore, the substance is not classified for this hazard because of data lacking

Reproductive Toxicity
No data on this property were found in literature. Therefore, the substance is not classified for this hazard because of data lacking

Routes of Entry
Oral

Symptoms Related to Exposure
n/a

Potential Health Effects
n/a

Target Organ(s) n/a

Section 12: Ecological Information

Ecotoxicity
Acute Toxicity to Fish Type: static Species: Brachydanio rerio (Fish, fresh water) Exposure period: 96 hour(s) Unit: mg/l Analytical monitoring: no data LC0: 5.77 Year: 1992 GLP: yes Method: SOP 4.002 Prüfrichtlinie " Akute Toxizität für Fische" (C. 1) Richtlinie 67/ 548/ EWG (29. 12. 1992) Abweichend von der SOP 4.002 erfolgt die Testdurchführung imabgedunkelten System Remark: Prüfeinrichtung Bayer AG, Institut für Umweltanalyse und Bewertungen Source: Arzneimittelwerk Dresden GmbH Radebeul Acute Toxicity to Aquatic Invertebrates Species: Daphnia magna (Crustacea) Exposure period: 48 hour(s) Unit: mg/ l Analytical monitoring: no data EC0: 3.88 Year: 1992 GLP: yes Method: SOP 4.004 Prüfrichtlinie " Akute Toxizität für Daphnien" (C. 2) Richtlinie 67/ 548/ EWG (29. 12. 1992) Abweichend von der SOP 4.004 erfolgt die Testdurchführung imabgedunkelten System Remark: Prüfeinrichtung Bayer AG, Institut für Umweltanalyse und Bewertungen Source: Arzneimittelwerk Dresden GmbH Radebeul Toxicity to Microorganisms e.g. Bacteria Type: aquatic Species: activated sludge of a predominantly domestic sewage Exposure period: 30 minute(s) Unit: mg/l Analytical monitoring: no data LC0: > 10000 Year: GLP: yes Method: ISO 8192 und Amtsblatt der EG L133 Teil C: Biologische Abbaubarkeit: Prüfung der Atmungshemmung (entspricht weitgehend der Testmethode OECD 209) SOP 3.005 Remark: Prüfeinrichtung Bayer AG, Institut für Umweltanalyse und Bewertungen Source: Arzneimittelwerk Dresden GmbH Radebeul

Persistance and Degradability
Biodegradation Type: aerobic Inoculum: Aerobic microorganism Concentration: 100 mg/ l related to the Test substance Degradation: 3% after 28 days Method: Bioabbau – Manometrischer Respirations- test Verfahren nach Richtlinie 79/ 831 EWG, Anhang V, Teil C (aktualisierte Fassung vom Juli 1990), Methode C. 4- D: Manometrischer Respirationstest (SOP 3. 003, 3.008) GLP: yes Remark: Prüfeinrichtung, Bayer AG, Institut für Umweltanalyse und Bewertungen Result: Not Readily Biodegradable Source: Arzneimittelwerk Dresden GmbH Radebeul

Bioaccumulative Potential
An estimated BCF of 13 was calculated for Nifedipine, using a log Kow of 2. 20 [Masumoto K et al; Yakugaku Zasshi 155(3): 213- 20 (1995)] and a regression- derived equation [Meylan WM et al; Environ Toxicol Chem 18: 664- 72 (1999)]. According to a classification scheme [Franke C et al; Chemosphere 29: 1501- 14 (1994)], this BCF suggests the potential for bioconcentration in aquatic organisms is low [United States National Library of Medicine, TOXNET, Toxicology Data Network, Hazardous Substances Data Bank (HSDB), Nifedipine (21829- 25- 4)

Mobility in Soil
The Koc of Nifedipine is estimated as 370, using a log Kow of 2.20 [Masumoto K et al; Yakugaku Zasshi 155(3): 213-20 (1995)] and a regressionderived equation [US EPA; Estimation Program Interface (EPI) Suite. Ver. 4.0. Jan, 2009]. According to a classification scheme [Swann RL et al; Res Rev 85: 17-28 (1983)], this estimated Koc value suggests that Nifedipine is expected to have moderate mobility in soil [United States National Library of Medicine, TOXNET, Toxicology Data Network, Hazardous Substances Data Bank (HSDB), Nifedipine (21829- 25-4)]

Other Adverse Effects

Nifedipine contains chromophores that absorb at wavelengths > 290 nm [Lyman WJ et al; Handbook of Chemical Property Estimation Methods. Washington, DC: Amer Chem Soc pp. 8- 12 (1990)] and therefore may be susceptible to direct photolysis by sunlight. Nifedipine is photosensitive and decomposes rapidly [Joshi GS, Burnett JC; Kirk- Othmer Encyclopedia of Chemical Technology. (2005). NY, NY: John Wiley & Sons; Cardiovascular Agents. Online Posting Date: October 17, 2003]. SECTION 13: Disposal considerations 13. 1. Waste treatment methods 13.1 Waste treatment methods Incineration (product). Reuse, when possible, the packaging for other purposes. 13.1.1 Product / Packaging disposal: Product residues should be considered special hazardous waste. Disposal must be performed through an authorized waste management firm, in compliance with national and local regulations. Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations. 13. 1. 2 Waste treatment- relevant information: The hazard level of waste containing this product should be evaluated according to applicable regulations. 13. 1. 3 Sewage disposal- relevant information: Waste should not be disposed of by release to sewers. 13.1.4 Other disposal recommendations: To ensure that risks are adequately controlled at the waste stage, disposal must be in accordance with current applicable laws and regulations and material characteristics at the time of disposal. Final decisions on the appropriate waste management method, in line with regional, national and European legislation, and possible adaptation to local conditions, remains the responsibility of the waste

Section 13: Disposal Considerations

Waste Disposal

aste treatment methods Incineration (product). Reuse, when possible, the packaging for other purposes. 13.1.1 Product / Packaging disposal: Product residues should be considered special hazardous waste. Disposal must be performed through an authorized waste management firm, in compliance with national and local regulations. Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations. Waste treatment- relevant information: The hazard level of waste containing this product should be evaluated according to applicable regulations. Sewage disposal- relevant information: Waste should not be disposed of by release to sewers

Disposal of Container

n/a

Other Considerations

T o ensure that risks are adequately controlled at the waste stage, disposal must be in accordance with current applicable laws and regulations and material characteristics at the time of disposal. Final decisions on the appropriate waste management method, in line with regional, national and European legislation, and possible adaptation to local conditions, remains the responsibility of the waste

Section 14: Transport Information

DOT Classification

This substance is not classified for each of the Regulations: European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), Regulations concerning the International Carriage of Dangerous Goods by Rail (RID), European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN), International Maritime Dangerous Goods (IMDG Code) (sea), and Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO- TI) (air). Nevertheless, this substance must be packed in packaging made of materials compatible with the relevant ICH short term and long term stability studies.

Section 15: Regulatory Information

Regulations

Seveso category H3 Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/ 2006 None Substance in Candidate List (Art. 59 REACH) No Substance subject to authorisation (Annex XIV REACH) No Healthcare controls Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected

Other

o chemical safety assessment has been processed for the substance because the provision of the article 14(1) does not apply to this substance (see also Section 1.1

Section 16: Other Information

n/a