MATERIAL SAFETY DATA SHEET

SRM Supplier: National Institute of Standards and Technology

SRM Number: 186g **Standard Reference Materials Program** MSDS Number: 186g 100 Bureau Drive, Stop 2321 **SRM Name: pH Standards**

Gaithersburg, Maryland 20899-2321 Potassium Dihvdrogen Phosphate (186-I-g); Disodium Hydrogen Phosphate (186-II-g)

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SECTION I. MATERIAL IDENTIFICATION

Material Name: pH Standards: Potassium Dihydrogen Phosphate (186-I-g); Disodium Hydrogen Phosphate (186-II-g)

Description: SRM 186g consists of two components, each prepared to ensure high purity and uniformity; KH₂PO₄, Potassium Dihydrogen Phosphate (186-I-g) and Na₂HPO₄, Disodium Hydrogen Phosphate (186-II-g). However, neither SRM component is certified for purity of substance. A unit of SRM 186g consists of 30 g of potassium dihydrogen phosphate (186-I-g) and 45 g of disodium hydrogen phosphate (186-II-g), each contained in its respective clear glass bottle.

Other Designations: Potassium Dihydrogen Phosphate (potassium acid phosphate; monopotassium phosphate; potassium diphosphate; potassium biphosphate; potassium orthophosphate; potassium dihydrogen phosphate)

Disodium Hydrogen Phosphate (disodium phosphate; disodium acid orthophosphate; soda phosphate; disodium phosphoric acid; disodium monohydrogen phosphate; monohydrogen disodium phosphate; DSP; sodium phosphate; sodium phosphate (Na₂HPO₄); hydrogen disodium phosphate; phosphoric acid, disodium salt; sodium monohydrogen phosphate; anhydrous sodium acid phosphate; disodium acid phosphate; dibasic sodium phosphate; disodium orthophosphate; disodium hydrogenorthophosphate)

Chemical Formula CAS Registry Number Potassium Dihydrogen Phosphate KH₂PO₄ 7778-77-0 Disodium Hydrogen Phosphate Na₂HPO₄ 7558-79-4

DOT Classification: Potassium dihydrogen phosphate and disodium hydrogen phosphate are not regulated by DOT.

SECTION II. HAZARDOUS INGREDIENTS

Hazardous Components	Nominal Concentration (%)	Exposure Limits and Toxicity Data	
Potassium Dihydrogen Phosphate	100	No occupational exposure limits established.	
Disodium Hydrogen Phosphate	100	No occupational exposure limits established.	
		Rat, Oral LD ₅₀ : 12.9 g/kg	
		Rat, Intraperitoneal: LD _{Lo} : 1 g/kg	
		Rat, Subcutaneous: LD _{Lo} : 1 g/kg	
		Rat, Intramuscular: LD _{Lo} : 1 g/kg	
		Rabbit, Intravenous: LD _{Lo} : 1075 mg/kg	

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SECTION III. PHYSICAL/CHEMICAL CHARACTERISTICS

Potassium Dihydrogen Phosphate	Disodium Hydrogen Phosphate
Appearance and Odor: white powder and granules; no odor	Appearance and Odor: white powder and granules; no odor
Molecular Weight: 136.09	Molecular Weight: 141.96
Specific Gravity (water = 1): 2.338	Specific Gravity (@ 16 °C; water = 1): 2.066 (dihydrate)
Boiling Point: not applicable	Boiling Point: not applicable
Melting Point: 253 °C	Melting Point: not available
pH: 4.1 - 4.5 @ 25 °C (5 % solution)	PH (@ 25 °C): 8.7 - 9.3 (5 % solution)
Water Solubility: 33 %	Water Solubility: 12.5 %
Solvent Solubility: insoluble in alcohol	Solvent Solubility: very slightly soluble in alcohol

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

	and Disodium	

Flash Point: Not Applicable Method Used: Not Applicable Autoignition Temperature: Not Applicable

Flammability Limits in Air (Volume %): UPPER: Not Applicable

> LOWER: Not Applicable

Unusual Fire and Explosion Hazards: These materials are negligible fire hazards.

Extinguishing Media: Use extinguishing agents appropriate for surrounding fire.

Special Fire Procedures: Fire fighters should wear a self-contained breathing apparatus (SCBA) with a full-face piece in the pressure demand or positive mode and other protective clothing.

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CTION V. REACTIVITY DATA					
Potassium Dihydrogen Phosphate and Disodium Hydrogen Phosphate:					
Stability: X	Stable	Unstable			
Conditions to Avoid: Avoid	generating dust.				
Incompatibility (Materials to bases. Strong bases may react	•	rogen phosphate is incomp	patible with metals and strong		
Disodium hydrogen phosphate is incompatible with metals and acids. Strong acids may react violently.					
Hazardous Decomposition o phosphorous oxides.	r Byproducts: Hazardous dec	omposition of potassium dil	hydrogen phosphate may form		
Hazardous decomposition of d	disodium hydrogen phosphate	can produce phosphorus oxi	ides and sodium oxides.		
Hazardous Polymerization	Will Occu	r <u>X</u>	Will Not Occur		

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SECTION VI. HEALTH HAZARD DATA

Route of Entry: X Inhalation X Skin X Ing	estion
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Health Hazards (Acute and Chronic)

Potassium dihydrogen phosphate is irritating to the eyes, skin, and respiratory system. It may be harmful if swallowed.

Eve Contact: Acute eye contact of potassium dihydrogen phosphate may cause mild irritation. There is no data for chronic exposure to the eyes.

Skin Contact: Exposure to the skin may cause irritation. Chronic exposure of potassium dihydrogen phosphate may cause dermatitis.

Inhalation: Inhalation of potassium dihydrogen phosphate may cause irritation of the nose and throat, coughing and choking. There is no data for chronic exposure.

Ingestion: Phosphates are slowly and incompletely absorbed when ingested. However, effects have occurred when large doses are ingested (acute exposure): nausea, vomiting, diarrhea, and stomach pain. If sufficient amounts are absorbed, slow or irregular heartbeat, weakening of cardiac contractility with hypotension, rapid breathing or shortness of breath, dizziness, mental confusion, weakness or heaviness of the legs, tiredness, paresthesias of the hands, feet, and lips, and paralysis may occur. Chronic exposure (repeated ingestion) may result in symptoms as detailed in acute ingestion. Bone and joint pain may also occur.

Disodium hydrogen phosphate is irritating to the eyes, skin, and respiratory system. It may be harmful if swallowed.

Eye Contact: Eye contact of disodium hydrogen phosphate may cause irritation with redness and pain. There is no data for chronic exposure to the eyes.

Skin Contact: Exposure to the skin may cause mild irritation and redness. Repeated and prolonged exposure may cause dermatitis.

Inhalation: Inhalation of disodium hydrogen phosphate may cause mild irritation of mucous membranes with sore throat, coughing, and difficulty breathing. There is no data for chronic exposure.

Ingestion: Ingestion of sodium hydrogen phosphate may result in pain and burning in the mouth, abdominal pain, nausea, vomiting, diarrhea, and cramps. Amounts greater than 45 ml of disodium hydrogen phosphate solution may cause a change in blood pressure, slow pulse, and coma.

Listed as a Carcinogen/Potential Carcinogen (Potassium Dihydrogen Phosphate and Disodium Hydrogen Phosphate):

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs	<u> </u>	X
By the Occupational Safety and Health Administration (OSHA)		X

EMERGENCY AND FIRST AID PROCEDURES:

Potassium Dihydrogen Phosphate and Disodium Hydrogen Phosphate:

Skin Contact: Remove contaminated shoes and clothing. Rinse affected area with large amounts of water followed by washing the area with soap and water. Watch for chemical irritations and treat them accordingly. Obtain medical assistance if necessary.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Obtain medical assistance immediately.

Inhalation: If inhaled, move the victim to fresh air. If breathing is difficult, give oxygen; if the victim is not breathing, give artificial respiration by qualified personnel. Obtain medical assistance immediately.

MSDS 186g Page 3 of 4 **Ingestion:** If a large amount is swallowed, obtain immediate medical attention.

SECTION VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Potassium Dihydrogen Phosphate and Disodium Hydrogen Phosphate:

Steps to be Taken in Case Material Is Released or Spilled: Collect spilled material in appropriate container for disposal. Avoid generating dust. If disodium hydrogen phosphate is accidentally released into the water, add alkaline material such as lime, crushed limestone, sodium bicarbonate, or soda ash.

Waste Disposal: Follow all federal, state, and local regulations.

Handling and Storage: Wear gloves and chemical safety glasses where contact with dust may occur. An eye wash station and washing facilities should be readily available near handling and use areas.

NOTE: Contact lenses pose a special problem; soft lenses may absorb irritants and all lenses concentrate them. **DO NOT** wear contact lenses in the laboratory.

Store and handle in accordance with all current regulations and standards. Store with caps tightly closed in a dry environment, and under normal laboratory temperature. Keep separated from incompatible substances.

SECTION VIII. SOURCE DATA/OTHER COMMENTS

Sources: MDL Information Systems, Inc., MSDS Sodium Phosphate, Dibasic, 19 March 2003.

MDL Information Systems, Inc., MSDS Potassium Phosphate Monobasic, 19 March 2003.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use in assessing the hazardous nature of the material. The MSDS was carefully prepared, using current references; however, NIST **DOES NOT** certify the data on the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.

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