MATERIAL SAFETY DATA SHEET

This form may be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200.
IDENTITY (As Used on Label and List): **Titanium phosphide, powder**
Product Code: **T-MSDS0016** Reference #: **12037-65-9**

SECTION I - PRODUCT IDENTIFICATION
Titanium phosphide, powder

MANUFACTURER NAME AND ADDRESS:

ProChem, Inc.
826 Roosevelt Rd.
Rockford IL 61109

TELEPHONE NUMBERS:

CHEMTREC	(800)424-9300
ProChem, Inc.	(800) 795-8788
Local Poison/Emrgncy	( ) - 911

DATES:

Date Created: 08/13/1986
Revision: 03/23/2004
Printed: 12/02/2005

SYNONYMS
Titanium phosphide

CHEMICAL FAMILY: Metal phosphide

DOT HAZARD LABEL: FLAMMABLE SOLID

FORMULA: TiP

MOLECULAR WEIGHT: 78.85

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION
Titanium phosphide, powder

HAZARDOUS COMPONENTS (CHEMICAL NAME)

NAME:	Titanium phosphide		
CAS #:	12037-65-9	**PERCENTAGE:**	0.0 -100.0 %
OSHA PEL:	NE	**ACGIH TLV:**	NE
OTHER LIMITS:	NE		
SEC.302 (EHS):	No	**SEC.304 RQ:**	No
SEC.313:	No		

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS
Titanium phosphide, powder

PHYSICAL STATES:	[ ] Gas , [ ] Liquid , [X] Solid
BOILING POINT:	N.A.
MELTING POINT:	1900.00 C (3452.0 F)
SPECIFIC GRAVITY (WATER = 1):	3.95 at 25.0 C (77.0 F)
DENSITY:	No data.
VAPOR PRESSURE (VS. AIR OR MM HG):	No data.
VAPOR DENSITY (VS. AIR = 1):	No data.
EVAPORATION RATE (VS BUTYL ACETATE=1):	No data.
SOLUBILITY IN WATER:	insoluble

OTHER SOLUBILITY NOTES: insoluble in acid
PERCENT VOLATILE: N.A.
PH: No data.
APPEARANCE AND ODOR
Grey metallic powder; no odor

SECTION IV - FIRE AND EXPLOSION HAZARD DATA
Titanium phosphide, powder

FLASH PT: N.A. **METHOD USED:** FLAMMABLE SOLID
EXPLOSIVE LIMITS: LEL: NE UEL: NE
EXTINGUISHING MEDIA
USE: Class D or other metal extinguishing agent.
DO NOT USE: Water.

SPECIAL FIRE FIGHTING PROCEDURES
Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

UNUSUAL FIRE AND EXPLOSION HAZARDS
When heated to decomposition, titanium phosphide may emit oxides of phosphorous.
Dangerous fire hazard, may react with water, moisture, steam, acid or acid fumes to produce phosphine, which often ignites.
Flammable when exposed to heat or flame.
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SECTION V - REACTIVITY DATA
Titanium phosphide, powder

STABILITY: Unstable [ ] Stable [X]
CONDITIONS TO AVOID - INSTABILITY
None

INCOMPATIBILITY - MATERIALS TO AVOID
Water, steam, moisture, acids, acid fumes and oxidizing agents.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS
Hydrogen phosphide (phophine) and phosphorus oxides

HAZARDOUS POLYMERIZATION: Will occur [ ] Will not occur [X]
CONDITIONS TO AVOID - HAZARDOUS POLYMERIZATION
None

SECTION VI - HEALTH HAZARD DATA
Titanium phosphide, powder

ROUTE(S) OF ENTRY: Inhalation? Yes , Skin? No , Eyes? No , Ingestion? Yes , Other: N

HEALTH HAZARDS (ACUTE AND CHRONIC)

To the best of our knowledge the chemical, physical and toxicological properties of titanium phosphide have not been thoroughly investigated and recorded.

Titanium is generally considered to by physiologically inert. There are no reported cases in the literature where titanium as such has caused human intoxication. The dusts of titanium or most titanium compounds may be placed in the nuisance category. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

Phosphine, titanium phosphide's primary decomposition product, is poisonous by inhalation. The chief effects are central nervous system depression and lung irritation. There may be pulmonary edema, dialation of the heart and hyperemia of the visceral organs. Inhalation can cause coma and convulsions leading to death within 48 hours. Chronic poisoning, characterized by anemia, bronchitis, gastrointestinal disturbances, may result from continued exposure to very low concentrations. (Sax, Dangerous Properties of Industrial Materials, eighth edition)

INHALATION:
Acute: Phosphine gas may cause severe irritation to the respiratory system, tightness of the chest, cough, severe burning sensation and shortness of breath.
Chronic: Phosphine gas may cause pulmonary edema.

INGESTION:
Acute: No acute health effects recorded.
Chronic: No chronic health effects recorded.

SKIN:
Acute: May cause irritation.
Chronic: Prolonged contact may cause chemical burns.

EYE:
Acute: May cause irritation.
Chronic: No chronic health effects recorded.

TARGET ORGANS: May affect the respiratory system.

CARCINOGENICITY: NTP? No , IARC Monographs? No , OSHA Regulated? No

CARCINOGENICITY/OTHER INFORMATION

No data available.

RECOMMENDED EXPOSURE LIMITS: See "Section II" **LD 50/LC 50:** No toxicity data recorded

SIGNS AND SYMPTOMS OF EXPOSURE

INHALATION: Systemic effects of phosphine inhalation include nausea, vomiting, thirst, dizziness, fatigue, abdominal pain, chest pain, shortness of breath, muscle pain, chills, tremors and restlessness.

INGESTION: No acute or chronic health effects recorded.

SKIN: May cause redness, itching and burning.

EYE: May cause redness, itching, burning and watering.

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MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

Pre-existing respiratory disorders.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove victim to fresh air; if conscious, encourage victim to blow nose, cough up, then spit out mucous and saliva;

keep warm and quite; give oxygen if breathing is difficult and seek medical attention.

INGESTION: Seek medical attention.

SKIN: Remove contaminated clothing from affected area; brush material off skin. Wash affected area with mild soap and water. Seek medical attention.

EYE: Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention.

NOTE TO PHYSICIAN
No data available.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE
Titanium phosphide, powder

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Wear appropriate respiratory and protective equipment specified in section VIII-control measures. Isolate spill area, provide ventilation and extinguish sources of ignition. Scoop or vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust. Use non-sparking tools.

WASTE DISPOSAL METHOD
Dispose of in accordance with applicable federal, state, and local regulations.

HAZARD LABEL INFORMATION:
Store away from incompatible material Store in tightly sealed container
Wash thoroughly after handling Store away from sparks, flames
PRECAUTIONS TO BE TAKEN IN HANDLING
Handle in a dry, inert atmosphere
PRECAUTIONS TO BE TAKEN IN STORING
Do not store with oxidizing and acidic materials
OTHER PRECAUTIONS
None.

SECTION VIII- CONTROL MEASURES
Titanium phosphide, powder

PROTECTIVE EQUIPMENT SUMMARY - HAZARD LABEL INFORMATION:
NIOSH approved respirator Impervious gloves Safety glasses
Clothes to prevent skin contact
RESPIRATORY EQUIPMENT (SPECIFY TYPE)
NIOSH-approved respirator.

VENTILATION:
LOCAL EXHAUST: To maintain concentration at low exposure levels **SPECIAL:** Handle in an inert atmoshpere such as argon
MECHANICAL (GENERAL): Not recommended **OTHER:** Engineering and work practices
EYE PROTECTION
Safety glasses

PROTECTIVE GLOVES
Rubber

OTHER PROTECTIVE CLOTHING
Protective gear suitable to prevent contamination.

WORK/HYGIENIC/MAINTENANCE PRACTICES
Implement engineering and work practice controls to reduce and maintain concentration at low exposure levels. Handle in a controlled, inert atmosphere. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Shower and change clothes at the end of workshift. Do not blow dust off clothing or skin with compressed air.

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SECTION IX - ADDITIONAL COMMENTS
Titanium phosphide, powder

SUPERCEDES REVISION 09/08/1993

HMIS HAZARD RATINGS:		OTHER HAZARD RATINGS:		
Health:	2	Health:	2	Minimal: 0
Flammability:	3	Flammability:	3	Slight: 1 Moderate: 2
Reactivity:	2	Reactivity:	2	Serious: 3 Extreme: 4
Protection:	H	Special Hazard:	H	

DOT PROPER SHIPPING NAME
Flammable solid, inorganic, n.o.s. (titanium phosphide)
DOT HAZARD CLASS: 4.1
DOT HAZARD LABEL: FLAMMABLE SOLID
UN/NA NUMBER: UN3178
PACKING GROUP: III

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Abbreviations used: NA=Not Applicable NE: Not Established