

MATERIAL SAFETY DATA SHEET

REVISED: 09/23/05

Section 1 – Product and Company Information

Product Name
Product Number

Adhesion Promoter
AP300

Company

SILICON RESOURCES, INC.
211 E. CHILTON DRIVE
CHANDLER, AZ 85225 USA

EMERGENCY TELEPHONE:
(800)424-9300 (CHEMTREC)
(480)503-4564 (INFORMATION)
(480)503-4628 (FAX)

Section 2 – Composition/Information on Ingredients

Substance Name	CAS #	%	SARA 313
2-PROPANOL	67-63-0	>80	Yes

Formula C₃H₈O
Synonyms Isopropyl alcohol; Isopropanol; 2-Propyl alcohol

TITANIUM ACETYLACETONATE	17927-72-9	<20	No
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Formula C₁₆H₂₈O₆Ti
Synonyms Titanium Diisopropoxy-bis(acetylacetonate); Titanium Diisopropoxy (bis-2,4-pentanedionate)

Section 3 – Hazards Identification

EMERGENCY OVERVIEW

Flammable (USA) Highly Flammable (EU). Irritant.
Irritating to eyes and skin. Vapors may cause drowsiness and dizziness.
Target organ(s): Nerves. Kidneys.

HMIS RATING

HEALTH: 2*
FLAMMABILITY: 3
REACTIVITY: 1

NFPA RATING

HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 1

*Additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 – First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE

In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 – Fire Fighting Measures

FLAMMABLE HAZARDS

Flammable Hazards: Yes

EXPLOSION HAZARDS

Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

FLASH POINT: 53°F 12°C Method: closed cup

EXPLOSION LIMITS: Lower: 2.5% Upper: 12%

AUTOIGNITION TEMP: 399°C

FLAMMABILITY: N/A

EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.

Specific Method(s) of Fire Fighting: Use water spray to cool fire-exposed containers.

Section 6 – Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition. Use non-sparking tools.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

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METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 – Handling and Storage

HANDLING:

User Exposure: Do not breathe vapor. Do not get in eyes, on skin, or clothing. Avoid prolonged or repeated exposure.

STORAGE:

Suitable: Keep tightly closed. Keep away from heat, sparks, and open flame. Store in a cool dry place. Handle and store under nitrogen.

SPECIAL REQUIREMENTS:

Handle and store under inert gas. Hygroscopic.

Section 8 – Exposure Controls/PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Use non-sparking tools. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Government approved respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Remove and wash contaminated clothing promptly. Wash thoroughly after handling.

EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	STEL	400 PPM
USA	ACGIH	TWA	200 PPM
USA	MSHA Standard-air	TWA	400 PPM (980 MG/M3)
USA	OSHA	PEL	8H TWA 400 PPM (980 MG/M3)
New Zealand	OEL		
Remarks: check ACGIH TLV			
USA	NIOSH	TWA	400 PPM
		STEL	500 PPM

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	900 MG/M3
Poland		NDSch	1200 MG/M3
Poland		NDSP	-

Section 9 – Physical/Chemical Properties

Appearance	Physical State: Liquid Color: Colorless	
Property	Value	At Temperature or Pressure
Molecular Weight	~60.1	
pH	N/A	
BP/BP Range	81.0 – 82.0°C	
MP/MP Range	~ -89.5°C	
Freezing Point	~ -88.0°C	
Vapor Pressure	33 mmHg	20°C
Vapor Density	2.1 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	~0.785 g/cm ³	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile %	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	3	
Viscosity	0.003 Pas	20°C
Surface Tension	20,800 mN/m	25°C
Partition Coefficient	Log Kow: 0.05	
Decomposition Temp.	N/A	
Flash Point	53°F 12°C	
Explosion Limits	Lower: 2.5% Upper: 12%	
Flammability	N/A	
Autoignition Temp	399°C	
Refractive Index	~1.378	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility in Water	Soluble	

N/A = not available

Section 10 – Stability and Reactivity

STABILITY

Stable: Stable:

Conditions of Instability: May form peroxides of unknown stability.

Materials to Avoid: Aluminum, Halogens, Acid anhydrides, Acids, Oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

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HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur.

Section 11 – Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes eye irritation.

Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.

Ingestion: May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Nerves. Kidneys. Cardiovascular system. G.I. System. Overexposure may cause mild, reversible liver effects.

SIGNS AND SYMPTOMS OF EXPOSURE

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

Drowsiness. Narcotic effect. Nausea, headache, and vomiting. Prolonged exposure can cause: Can cause CNS depression.

TOXICITY DATA

Oral

Man

5272 mg/kg

LDLO

Remarks: Lungs, Thorax, or Respiration: Chronic pulmonary edema.

Vascular: BP lowering not characterized in autonomic section.

Behavioral: Coma.

Oral

Human

3570 mg/kg

LDLO

Remarks: Behavioral: Coma. Lungs, Thorax, or

Respiration: Respiratory depression. Gastrointestinal: Nausea or vomiting.

Oral

Rat

5045 mg/kg

LD50

Remarks: Behavioral: Somnolence (general depressed activity).

Behavioral: Altered sleep time (including change in righting reflex).

Inhalation
Rat
16,000 ppm
LC50

Intraperitoneal
Rat
2735 MG/KG
LD50

Intravenous
Rat
1088 MG/KG
LD50

Oral
Mouse
3600 mg/kg
LD50

Remarks: Behavioral: Altered sleep time (including change in righting reflex). Behavioral: Somnolence (general depressed activity).

Intraperitoneal
Mouse
4477 MG/KG
LD50

Intravenous
Mouse
1509 MG/KG
LD50

Oral
Rabbit
6410 mg/kg
LD50

Skin
Rabbit
12800 mg/kg
LD50

Intraperitoneal
Rabbit
667 mg/kg
LD50

Intravenous
Rabbit
1184 mg/kg
LD50

Intraperitoneal
Guinea Pig
2560 mg/kg
LD50

Intraperitoneal
Hamster
3444 mg/kg
LD50

IRRITATION DATA

Skin
Rabbit
500 mg

Remarks: Mild irritation effect

Eyes
Rabbit
100 mg
Severe irritation
effect

Eyes
Rabbit
10 mg
Moderate irritation
effect

Eyes
Rabbit
100 mg/24H
Moderate irritation
effect

CHRONIC EXPOSURE – CARCINOGEN

Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC CARCINOGEN LIST

Rating: Group 3

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CHRONIC EXPOSURE – TERATOGEN

Species: Rat

Dose: 8 gm/kg

Route of Application: Oral

Exposure Time: (6-15D PREG)

Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat

Dose: 32400 ug/kg

Route of Application: Oral

Exposure Time: (26W PRE)

Result: Effects on Embryo or Fetus: Fetal death.

Species: Rat

Dose: 3500 PPM/7H

Route of Application: Inhalation

Exposure Time: (1-19D PREG)

Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g. stunted fetus).

Species: Rat

Dose: 7000 PPM/7H

Route of Application: Inhalation

Exposure Time: (1-19D PREG)

Result: Specific Developmental Abnormalities: Musculoskeletal system.

CHRONIC EXPOSURE – MUTAGEN

Species: Rat

Route: Inhalation

Dose: 1030 ug/m³/16w-I

Mutation test: Cytogenetic analysis

CHRONIC EXPOSURE – REPRODUCTIVE HAZARD

Species: Rat

Dose: 11340 mg/kg

Route of Application: Oral

Exposure Time: (45D PRE)

Result: Maternal Effects: Menstrual cycle changes or disorders.

Species: Rat

Dose: 5040 mg/kg

Route of Application: Oral

Exposure Time: (1-20D PREG)

Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Rat
Dose: 3500 gm/kg
Route of Application: Oral
Exposure Time: (MULTIGENERATION)
Result: Effects on Fertility: Mating performance (e.g., # sperm positive females per # females mated; # copulations per # estrus cycles).

Species: Rat
Dose: 10000 PPM/7H
Route of Application: Inhalation
Exposure Time: (1-19D PREG)
Result: Effects on Embryo or Fetus: Fetal death. Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea).

Species: Rabbit
Dose: 6240 mg/kg
Route of Application: Oral
Exposure Time: (6-18D PREG)
Result: Maternal Effects: Other effects.

Section 12 – Biological Information

ACUTE ECOTOXICITY TESTS

Test Type: LC50 Fish
Species: Pimephales promelas (Fathead minnow)
Time 96 H
Value: 9.64- mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 24 H
Value: 5,102 mg/l

Test Type: EC50 Algae
Species: Scenedesmus subspicatus
Time: 72 H
Value: >2,000 mg/l

Test Type: EC50 Algae
Time: 24 H
Value: >1,000 mg/l

Section 13 – Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

Section 14 – Transport Information

DOT

Proper Shipping Name:	Isopropanol (or) Isopropyl alcohol
UN#:	1219
Class:	3
Packing Group:	Packing Group II
Hazard Label:	Flammable liquid
PIH:	Not PIH

IATA

Proper Shipping Name:	Isopropanol
IATA UN#:	1219
Hazard Class:	3
Packing Group:	II

Section 15 – Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: F-Xi

Indication of Danger: Highly Flammable. Irritant.

R: 11-36-67

Risk Statements: Highly flammable. Irritating to eyes. Vapors may cause drowsiness and dizziness.

S: 7-16-24/25-26

Safety Statements: Keep container tightly closed. Keep away from sources of ignition – no smoking. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Flammable (USA) Highly Flammable (EU).

Irritant.

Risk Statements: Irritating to eyes and skin. Vapors may cause drowsiness and dizziness.

Safety Statements: Keep container tightly closed. Keep away from sources of ignition – no smoking. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

US Statements: Target organ(s): Nerves. Kidneys.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes

DEMINIMIS: 0.1%

NOTES: This product is subject to SARA section 313 reporting requirements.

TSCA INVENTORY ITEM: Yes

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CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CFR.

DSL: Yes

NDSL: No

Section 16 – Other Information

DISCLAIMER

For R&D or manufacturing use only. Not for drug, household or other uses.

US HTS 2905.12.00

ADDITIONAL INFORMATION:

THESE DATA ARE OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS MADE. THE RECOMMENDED HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTENT OF THE INTENDED USE.