CoorsTek

SAFETY DATA SHEET

SECTION 1. IDENTIFICATION

GHS product identifier Tetralon with Titanium Diboridet

Other means of identification

Relevant identified uses of the substance or mixture and uses advised against Hard ceramic material used in armor and cutting tool applications.

Supplier's details

CoorsTek, Inc.
16000 Table Mountain Parkway Golden, CO 80403
Phone: +1 303 271 7000
Fax: +1 303 271 7009

Emergency telephone number (with hours of operation)

+1 303 271 7000
7:00 AM - 4:00 PM MST

SECTION 2. HAZARDS IDENTIFICATION

OSHA/HCS Status While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture Not classified

GHS LABEL ELEMENTS

Signal word No signal word

Hazard statements No known significant effects or critical hazards

PRECAUTIONARY STATEMENTS

Prevention Not applicable

Response Not applicable

Storage Not applicable

Disposal Not applicable

Hazards not otherwise classified None Known

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/mixture Mixture

Other means of identification Not available

CAS NUMBER/OTHER IDENTIFIERS

CAS number Not applicable

Product code Not available

Ingredient name	%	CAS Number
Titanium diboride	60-100	12045-63-5
Chromium diboride	1 - 5	12007-16-8
Nickel	0 - 15	7440-02-0
Cobalt	0 - 15	7440-48-4
Iron	0 - 15	7439-89-6
Tungsten	0 - 6	7440-33-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4. FIRST AID MEASURES

DESCRIPTION OF NECESSARY FIRST AID MEASURES

Eye contact Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

Inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

Skin contact Flush contaminated skin with plenty of water. Get medical attention if symptoms occur.

Ingestion Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

MOST IMPORTANT SYMPTOMS/EFFECTS, ACUTE AND DELAYED

POTENTIAL ACUTE HEALTH EFFECTS

Eye contact No known significant effects or critical hazards.

Inhalation Mechanical irritation of the nose, mouth, and throat may occur.

Skin contact No known significant effects or critical hazards

Ingestion No known significant effects or critical hazards

OVER-EXPOSURE SIGNS/SYMPTOMS

Eye contact No known significant effects or critical hazards

Inhalation No known significant effects or critical hazards

Skin contact No known significant effects or critical hazards

Ingestion No known significant effects or critical hazards

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED, IF NECESSARY

Notes to physician Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments No specific treatment

Protection of first-aiders No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

SECTION 5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Suitable extinguishing media

Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media

None known

Specific hazards arising from the chemical

No specific fire or explosion hazard

Hazardous thermal decomposition products

Decomposition products may include the following materials:

- metal oxide/oxides

Special protective actions for fire-fighters

No special measures are required

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT & EMERGENCY PROCEDURES

For non-emergency personnel

No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering.

For emergency responders

If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in “For non–emergency personnel”.

Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

METHODS & MATERIALS FOR CONTAINMENT AND CLEANING UP

Spill

Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

SECTION 7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING

Protective Measures	Put on appropriate personal protective equipment (see Section 8).
Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures. Remove contaminated clothing and protective equipment before entering eating areas.
Conditions for safe storage, including any incompatibilities	No special precautions necessary.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL PARAMETERS

Occupational exposure limits	None
Appropriate engineering controls	Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

INDIVIDUAL PROTECTION MEASURES

Hygiene measures	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Ensure that eyewash stations and safety showers are close to the workstation location.
Eye/face protection	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with sideshields.

SKIN PROTECTION

Hand protection	Wear gloves if needed.
Body protection	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product
Other skin protection	Appropriate footwear should be selected based on the task being performed and the risks involved
Respiratory protection	Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Physical state	Solid
Color	Grayish-white
Odor	Odorless.
Odor threshold	Not available
pH	Not available
Melting point/freezing point	Not available
Boiling point/boiling range	Not available
Flash point	Not available
Evaporation rate	Not available
Flammability (solid, gas)	Not available
Lower and upper explosive (flammable) limits	Not available
Vapor pressure	Not available
Vapor density	Not available
Relative density	4.53
Solubility	Insoluble in the following materials: cold water and hot water.
Partition coefficient: n- octanol/water	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Volatillity	Not available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	The product is stable
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur
Conditions to avoid	No specific data
Incompatible materials	Reactive or incompatible with the following materials: acids and alkalis. Non-reactive or compatible with the following materials: oxidizing materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11. TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Acute toxicity	There is no data available
Irritation/Corrosion	There is no data available
Sensitization	There is no data available
Carcinogenicity	There is no data available
Specific target organ toxicity (single exposure)	There is no data available
Specific target organ toxicity (repeated exposure)	There is no data available
Aspiration hazard	There is no data available
Information on the likely routes of exposure	Not available

POTENTIAL ACUTE HEALTH EFFECTS

Eye contact	No known significant effects or critical hazards.
Inhalation	No known significant effects or critical hazards.
Skin contact	No known significant effects or critical hazards.
Ingestion	No known significant effects or critical hazards.

SECTION 11. TOXICOLOGICAL INFORMATION CONTINUED

SYMPTOMS RELATED TO THE PHYSICAL, CHEMICAL AND TOXICOLOGICAL CHARACTERISTICS

Eye contact No known significant effects or critical hazards.

Inhalation Heating this material to temperatures above 500F can produce harmful fumes. Toxic gases can be formed above 750F. Inhaling decomposition products can cause the temporary condition of “Polymer fume fever”. Symptoms are flu-like and include fever, cough, and malaise.

Skin contact No known significant effects or critical hazards

Ingestion No known significant effects or critical hazards

DELAYED AND IMMEDIATE EFFECTS AND ALSO CHRONIC EFFECTS FROM SHORT AND LONG TERM EXPOSURE

SHORT TERM EXPOSURE

Potential immediate effects No known significant effects or critical hazards

Potential delayed effects No known significant effects or critical hazards

LONG TERM EXPOSURE

Potential immediate effects No known significant effects or critical hazards

Potential delayed effects No known significant effects or critical hazards

POTENTIAL CHRONIC HEALTH EFFECTS

General No known significant effects or critical hazards

Carcinogenicity No known significant effects or critical hazards

Mutagenicity No known significant effects or critical hazards

Teratogenicity No known significant effects or critical hazards

Developmental effects No known significant effects or critical hazards

Fertility effects No known significant effects or critical hazards

NUMERICAL MEASURES OF TOXICITY

Acute toxicity estimates There is no data available

SECTION 12. ECOLOGICAL INFORMATION

Toxicity There is no data available

Persistence and degradability There is no data available

Bioaccumulative potential There is no data available

MOBILITY IN SOIL

Soil/water partition coefficient (K_{OC}) Not available.

Other adverse effects No known significant effects or critical hazards

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions, and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains, and sewers.

SECTION 14. TRANSPORT INFORMATION

	DOT	IMDG	IATA
UN Number	Not regulated	Not regulated	Not regulated
UN proper shipping name	-	-	-
Transport hazard class(es)	-	-	-
Packing group	-	-	-
Environmental hazards	No	No	No
Additional information	-	-	-

Special precautions for user **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not available

SECTION 15. REGULATORY INFORMATION

U.S. Federal regulations

TSCA 8(a) PAIR: Tungsten
TSCA 8(a) CDR Exempt/Partial exemption: Not determined
United States inventory (TSCA 8b): Not determined
Clean Water Act (CWA) 307: Nickel

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)

Listed

Clean Air Act Section 602 Class I Substances

Not listed

Clean Air Act Section 602 Class II Substances

Not listed

DEA List I Chemicals (Precursor Chemicals)

Not listed

DEA List II Chemicals (Essential Chemicals)

Not listed

SARA 302/304

Composition/information on ingredients

No products were found

SARA 304 RQ

Not applicable

SARA 311/312

Classification

Not applicable

Name	%	Fire Hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Nickel	5 - 10	No	No	No	Yes	Yes
Cobalt	5 - 10	No	No	No	Yes	No
Chromium diboride	1 - 5	No	No	No	Yes	Yes

SARA 313

	Product name	CAS Number	%
Form R - Reporting requirements	Nickel	7440-02-0	5 - 10
	Cobalt	7440-48-4	5 - 10
Supplier notification	Nickel	7440-02-0	5 - 10
	Cobalt	7440-48-4	5 - 10

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

SECTION 15. REGULATORY INFORMATION CONTINUED

STATE REGULATIONS

Massachusetts The following components are listed: Tungsten; Cobalt; Nickel

New York The following components are listed: Nickel

New Jersey The following components are listed: Tungsten; Cobalt; Nickel

Pennsylvania The following components are listed: Tungsten; Cobalt; Nickel

California Prop. 65 WARNING: This product contains a chemical known to the State of California to cause cancer.

Ingredient Name	Cancer	Reproductive	No Significant risk level	Maximum acceptable dosage level
Nickel	Yes	No	No	No
Cobalt	Yes	No	No	No

INTERNATIONAL REGULATIONS

International lists
Australia inventory (AICS): Not determined.
China inventory (IECSC): Not determined.
Japan inventory: Not determined.
Korea inventory: Not determined.
Malaysia Inventory (EHS Register): Not determined.
New Zealand Inventory of Chemicals (NZIoC): Not determined.
Philippines inventory (PICCS): Not determined.
Taiwan inventory (CSNN): Not determined.

Chemical Weapons Convention List Schedule I Chemicals Not listed

Chemical Weapons Convention List Schedule II Chemicals Not listed

Chemical Weapons Convention List Schedule III Chemicals Not listed

SECTION 16. OTHER INFORMATION

HAZARDOUS MATERIAL INFORMATION SYSTEM (U.S.A.)

Health: 0 * **Flammability:** 0 **Physical hazards:** 0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller+1 800 327 6868.

The customer is responsible for determining the PPE code for this material.

NATIONAL FIRE PROTECTION ASSOCIATION (U.S.A.)

Health: 0 **Flammability:** 0 **Physical hazards:** 0

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HISTORY

Date of issue mm/dd/yyyy 10/15/2013

Version 1

Prepared by KMK Regulatory Services Inc.

Key to abbreviations

ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.