

Material Safety Data Sheet

acc. to ISO/DIS 11014

Printing date 02/02/2004







Reviewed on 02/02/2004

1 Identification of substance

- **Product details**
- **Trade name:** Sulfide No.2
- **Product Use:** Reagent
- **Part of Orion:** AC2016
- **MSDS p/n:** 233270-001 Revision D
- **Manufacturer/Supplier:**
Thermo Electron Corporation
Environmental Instruments
Water Analysis Group
166 Cummings Center
Beverly, MA 01915-6110
USA
Phone: 978-232-6000
Made in Germany

2 Composition / Data on components

- **Chemical characterization**
- **Description:** Mixture of the substances listed below with nonhazardous additions.

CAS No.	Description		
CAS: 10034-88-5 EINECS: 231-665-7	sodium hydrogensulphate	 Xi; R 41	60-70%
CAS: 124-04-9 EINECS: 204-673-3	adipic acid	 Xi; R 36	10-20%
CAS: 7789-00-6 EINECS: 232-140-5	potassium chromate	 T,  N; R 49-46-36/37/38-43-50/53	0.1-1.0%
CAS: 7778-50-9 EINECS: 231-906-6	potassium dichromate	 T+,  N; R 49-46-21-25-26-37/38-41-43-50/53	0.1-1.0%

- **Additional information:**
The remaining 8% contains no hazardous ingredients according to OSHA definition.
Contains potassium chromate, potassium dichromate. May cause allergic reaction.

3 Hazards identification

- **Hazard description:**



T Toxic

- **Information pertaining to particular dangers for man and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.
May cause cancer by inhalation.
May cause heritable genetic damage.
Risk of serious damage to eyes.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment
Only for trade users
- **Classification system:**
The classification was made according to the latest editions of international substances lists, and expanded upon from company and literature data.

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· **NFPA ratings (scale 0 - 4)**

Health = 2

Fire = 1

Reactivity = 0

4 First aid measures

· **After inhalation:**

Supply fresh air or oxygen; call for doctor.

In case of unconsciousness remove to fresh air, apply artificial respiration, and consult a physician.

· **After skin contact:** Immediately rinse with water.

· **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.

· **After swallowing:** Drink copious amounts of water and provide fresh air. Immediately call a doctor.

· **The following symptoms may occur:**

After inhalation:

Irritations

Allergic reactions

After swallowing:

Unconsciousness

Diarrhoea

Mucous membrane irritation

Coughing

Breathing difficulty

· **Danger** risk of skin sensitization

5 Fire fighting measures

· **Suitable extinguishing agents:**

Water

Foam

Use fire fighting measures that suit the environment.

· **Special hazards caused by the material, its products of combustion or resulting gases:**

Formation of toxic gases is possible during heating or in case of fire.

Sulfur oxides (SO_x)

· **Protective equipment:** Wear self-contained respiratory protective device.

· **Additional information**

Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

Collect contaminated fire fighting water separately. It must not enter the sewage system.

6 Accidental release measures

· **Person-related safety precautions:**

Wear protective equipment. Keep unprotected persons away.

Use respiratory protective device against the effects of fumes/dust/aerosol.

· **Measures for environmental protection:**

Do not allow product to reach sewage system or any water course.

Inform respective authorities in case of seepage into water course or sewage system.

Do not allow to enter sewers/ surface or ground water.

· **Measures for cleaning/collecting:**

Dispose contaminated material as waste according to item 13.

Ensure adequate ventilation.

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7 Handling and storage

- **Handling:**
- **Information for safe handling:** Work only in fume cabinet.
- **Information about protection against explosions and fires:**
Protect from heat.
Keep respiratory protective device available.
The product is not flammable.
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** Store in a cool location.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**
Keep receptacle tightly sealed.
Store in dry conditions.
- **Storage class:** Not required.

8 Exposure controls and personal protection

- **Additional information about design of technical systems:** No further data; see item 7.

- **Components with limit values that require monitoring at the workplace:**

124-04-9 adipic acid (10-20%)

ACGIH TLV 5 mg/m³

7778-50-9 potassium dichromate (0.1-1.0%)

ACGIH TLV 0.05, A1 mg/m³

as Cr, water soluble; (q)

NIOSH REL 0.001 mg/m³

as Cr, water soluble; Ca

OSHA PEL Short-term value: C 0.1* mg/m³

as Cr, water soluble; *as CrO₃

7789-00-6 potassium chromate (0.1-1.0%)

ACGIH TLV 0.05, A1 mg/m³

as Cr, water soluble; (q)

NIOSH REL 0.001 mg/m³

as Cr, water soluble; Ca

OSHA PEL Short-term value: C 0.1* mg/m³

as Cr, water soluble; *as CrO₃

- **Additional information:** The lists that were valid during the creation were used as basis.

- **Personal protective equipment:**

- **General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes.

- **Breathing equipment:**

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

- **Protection of hands:**

Only use chemical-protective gloves with CE-labelling of category III.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Use gloves of stable material (e.g. Nitrile) - if necessary tricoted to improve the wearability.
After use of gloves apply skin-cleaning agents and skin cosmetics.

- **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Natural rubber, NR

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PVC or PE gloves

- **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

- **Eye protection:** Tightly sealed goggles

- **Body protection:** Light weight protective clothing

9 Physical and chemical properties

· Odor Threshold:	Not applicable.
· Form:	Tablets
· Color:	White
· Odor:	Odorless
· Melting point/Melting range:	Undetermined.
· Boiling point/Boiling range:	265°C (509°F)
· Freezing Point:	Not applicable.
· Flash point:	> 100°C (> 212°F)
· Flammability (solid, gaseous):	
Upper Flammable Limit:	Not applicable.
Lower Flammable Limit:	Not applicable.
· Ignition temperature:	405.0°C (761°F)
· Sensitivity to Mechanical Impact:	None
· Sensitivity to Static Discharge:	None
· Auto igniting:	Product is not selfigniting.
· Danger of explosion:	Product does not present an explosion hazard.
· Vapor Pressure at 20°C (68°F):	2.7 hPa (2 mm Hg)
· Vapor Density:	Not applicable.
· Specific Gravity:	Not applicable.
· Density at 20°C (68°F):	1.885 g/cm ³
· Solubility in / Miscibility with Water:	Soluble.
· Coefficient of Water / Oil Distribution:	Not applicable.
· pH-value (11.1 g/l) at 20°C (68°F):	1.7
· Solvent content:	
Organic solvents:	0.0 %
· Solids content:	100.0 %

10 Stability and reactivity

- **Thermal decomposition / conditions to be avoided:** strong heating

- **Materials to be avoided:**

combustible substances

organic substances

alcohols

- **Dangerous reactions**

Corrosive action on metals.

Corrodes aluminium.

- **Dangerous products of decomposition:** Sulfur oxides (SO_x)

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11 Toxicological information

· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

10043-35-3 boric acid, crude natural, containing not more than 85 per cent of H3BO3 calculated on the dry weight

Oral	LD50	2660 mg/kg (rat)
Dermal	LD50	> 2000 mg/kg (rat)

124-04-9 adipic acid

Oral	LD50	5700 mg/kg (rat)
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7778-50-9 potassium dichromate

Oral	LD50	25 mg/kg (rat)
Dermal	LD50	1170 mg/kg (rat)
Inhalative	LC50/4 h	0.094 mg/l (rat)

7789-00-6 potassium chromate

Oral	LD50	180 mg/kg (mouse)
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· **Primary irritant effect:**

· **on the skin:** No irritant effect.

· **on the eye:** Strong irritant with the danger of severe eye injury.

· **Sensitization:** No sensitizing effects known.

· **Additional toxicological information:**

The product shows the following dangers according to internally approved calculation methods for preparations:

Irritant

Carcinogenic if inhaled.

The product can cause inheritable damage.

· **Carcinogenicity: NTP? IARC Monographs? OSHA Regulated?**

potassium chromate, potassium dichromate:

ACGIH: A1 - Confirmed Human Carcinogen (listed as **undefined**)

California: carcinogen ; initial date 2/27/87 (listed as **undefined**)

NTP: Known carcinogen (listed as **undefined**)

OSHA: Possible select carcinogen (listed as **undefined**)

IARC: Group 3 carcinogen (listed as **undefined**)

· **Teratogenicity:**

potassium chromate:

TDLo (Intraperitoneal, mouse) = 30 mg/kg

· **Mutagenicity:** Not found.

· **Reproductive Toxicity:**

Not found.

potassium dichromate:

oral, rat TDLo = 525 mg/kg (female 21 days after conception)

· **Synergistic Products:** None

12 Ecological information

· **Behavior in environmental systems:**

10043-35-3 boric acid, crude natural, containing not more than 85 per cent of H3BO3 calculated on the dry weight

log P(o/w)	0.76 (25°C) (.)
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124-04-9 adipic acid

log P(o/w)	0.093 (25°C) (.)
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· **Ecotoxicological effects:**

· **Acquatic toxicity:**

10043-35-3 boric acid, crude natural, containing not more than 85 per cent of H3BO3 calculated on the dry weight

EC50	133 mg/l/48h (Daphnia magna)
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124-04-9 adipic acid

EC50	86 mg/l/48h (Daphnia magna)
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LC50	511 mg/l/48h (<i>Leuciscus idus</i>) 97 mg/l/96h (<i>Pimephales promelas</i>)
7778-50-9 potassium dichromate	
LC50	58.5 mg/l/96h (<i>Brachydanio rerio</i>) 160 mg/l/96h (<i>Poecilia reticulata</i>)

- **Remark:** Harmful to fish
- **Additional ecological information:**

· BSB5-value:	
124-04-9 adipic acid	
BSB5	0.598 g/g (-)

- **General notes:**
Water hazard class 2 (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
Harmful to aquatic organisms
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Must not reach bodies of water or drainage ditch undiluted or unneutralized.

13 Disposal considerations

- **Product:**
- **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.
- **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

- **DOT regulations:**



- **Hazard class:** 8
- **Identification number:** UN2923
- **Packing group:** III
- **Proper shipping name (technical name):** CORROSIVE SOLID, TOXIC, N.O.S. (sodium hydrogensulphate, potassium chromate)
- **Label:** 8+6.1

- **Land transport ADR/RID (cross-border):**



- **ADR/RID class:** 8 (CT2) Corrosive substances
- **Danger code (Kemler):** 86
- **UN-Number:** 2923
- **Packaging group:** III

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· **Description of goods:** 2923 CORROSIVE SOLID, TOXIC, N.O.S. (sodium hydrogensulphate, potassium chromate)

· **Maritime transport IMDG:**



· **IMDG Class:** 8
 · **UN Number:** 2923
 · **Label** 8+6.1
 · **Packaging group:** III
 · **EMS Number:** F-A,S-B
 · **Marine pollutant:** No
 · **Propper shipping name:** CORROSIVE SOLID, TOXIC, N.O.S. (sodium hydrogensulphate, potassium chromate)

· **Air transport ICAO-TI and IATA-DGR:**



· **ICAO/IATA Class:** 8
 · **UN/ID Number:** 2923
 · **Label** 8+6.1
 · **Packaging group:** III
 · **Propper shipping name:** CORROSIVE SOLID, TOXIC, N.O.S. (sodium hydrogensulphate, potassium chromate)
 · **TDG Class:** 8

15 Regulations

· **Sara**

· **Section 355 (Extremely hazardous substances):**

None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**

This mixture contains Chromic acid, dipotassium salt [listed as ****undefined**** - Cr(VI)] which is subject to the reporting requirements of Section 313 SARA Title III and 40 CFR Part 372.

None of the ingredients is listed.

· **TSCA (Toxic Substances Control Act):**

10043-35-3	boric acid, crude natural, containing not more than 85 per cent of H3BO3 calculated on the dry weight
124-04-9	adipic acid
7778-50-9	potassium dichromate
7789-00-6	potassium chromate

· **Proposition 65**

· **Chemicals known to cause cancer:**

Chromium (hexavalent compounds) are listed in California Proposition 65 as carcinogens.

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity:**

None of the ingredients is listed.

· **Canadian Ingredient Disclosure List**

· **Limit 0,1%**

7778-50-9 | potassium dichromate

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· Limit 1%	
10043-35-3	boric acid, crude natural, containing not more than 85 per cent of H3BO3 calculated on the dry weight
124-04-9	adipic acid
7789-00-6	potassium chromate

· **Other Regulations**

· **EPA (Environmental Protection Agency)**
None of the ingredients is listed.

· **IARC (International Agency for Research on Cancer)**
see chapter 11
None of the ingredients is listed.

· **NTP (National Toxicology Program)**
see chapter 11
None of the ingredients is listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
see chapter 8 / 11
None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**
see chapter 8 / 11
None of the ingredients is listed.

· **Product related hazard informations:**

The product has been classified and marked in accordance with directives on hazardous materials.

· **Hazard symbols:**

T Toxic

· **Hazard-determining components of labelling:**

potassium chromate
potassium dichromate

· **Risk phrases:**

May cause cancer by inhalation.
May cause heritable genetic damage.
Risk of serious damage to eyes.
Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment

· **Safety phrases:**

Avoid exposure - obtain special instructions before use.
Keep locked up and out of the reach of children.
In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Do not empty into drains, dispose of this material and its container at hazardous or special waste collection point
Wear suitable protective clothing and eye/face protection.
In case of accident or if you feel unwell, seek medical advice immediately.

· **Special labeling of certain preparations:**

Only for trade users

· **Technical instructions (air):**

Class	Share in %
II	0,1-1,0

· **Water hazard class:** Water hazard class 2 (Self-assessment): hazardous for water.

· **CPR Classification:** Class E

· **MSDS Discloses Information Elements Required by the CPR .**

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16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Contact:** Thermo Electron Corporation, EID, Water Analysis, Quality Assurance
- *** Data compared to the previous version altered.**

USA