

Printing date 05/13/2014

Reviewed on 05/13/2014

* 1 Identification

- **Product identifier**
- **Trade name:** **Phosphate HR P1**
- **SDS p/n:** 233263-001 Rev. H
- **Part of Thermo Scientific item:** Orion AC2096
- **Relevant identified uses of the substance or mixture and uses advised against:** No further relevant information available.
- **Application of the substance / the mixture:** Reagent for water analysis
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Thermo Fisher Scientific
22 Alpha Road
Chelmsford, MA 01824
USA
phone: 978-232-6000
Made in Germany
- **CHEMTREC® 24 hr Emergency:** US 800-424-9300; International 703-527-3887

* 2 Hazard(s) identification

- **Classification of the substance or mixture**

US-GHS



GHS08 Health hazard

Repr. 1B H360 May damage fertility or the unborn child.



GHS05 Corrosion

Eye Dam. 1 H318 Causes serious eye damage.

- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**



T; Toxic

R60-61: May impair fertility. May cause harm to the unborn child.



Xi; Irritant

R41: Risk of serious damage to eyes.

- **Label elements**

· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms** GHS05, GHS08

· **Signal word** Danger

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

sodium bisulfate

boric acid

· **Hazard statements**

H318 Causes serious eye damage.

H360 May damage fertility or the unborn child.

· **Precautionary statements**

P280 Wear protective gloves / eye protection.

P201 Obtain special instructions before use.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P310 Immediately call a POISON CENTER/doctor.

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P308+P313 IF exposed or concerned: Get medical advice/attention.
P405 Store locked up.

Canadian Hazard Symbols:



WHMIS classification:

D2A
Very toxic material causing other toxic effects
E
Corrosive material

NFPA ratings (scale 0 - 4)



Health = 2
Fire = 0
Reactivity = 0

* 3 Composition/information on ingredients

- Chemical characterization: Mixtures
- Description: mixture of inorganic compounds

Composition and Information on Ingredients:

CAS: 7681-38-1 EINECS: 231-665-7 Index number: 016-046-00-X RTECS: VZ1860000	sodium bisulfate	Xi R41 Eye Dam. 1, H318	30-40%
CAS: 12125-02-9 EINECS: 235-186-4 Index number: 017-014-00-8 RTECS: BP 4550000	ammonium chloride	Xn R22; Xi R36 Acute Tox. 4, H302; Eye Irrit. 2, H319	20-30%
CAS: 10043-35-3 EINECS: 233-139-2 Index number: 005-007-00-2 RTECS: ED 4550000	boric acid	T Repr. Cat. 2 R60-61 Repr. 1B, H360	10-20%

- REACH - pre-registered substances All components are REACH pre-registered.

SVHC

10043-35-3	boric acid
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- Additional information: For the wording of the listed risk phrases refer to section 16.

* 4 First-aid measures

- Description of first aid measures
- General information: Immediately remove any clothing soiled by the product.
- After inhalation:
Supply fresh air.
Seek medical treatment.
- After skin contact:
Immediately wash with water and soap and rinse thoroughly.
Seek medical treatment.
- After eye contact:
Rinse opened eye for several minutes (15 min) under running water. Then consult a doctor.
Call a doctor immediately.
- After swallowing:
Rinse out mouth and then drink 1-2 glasses of water.
Seek medical treatment.
- Most important symptoms and effects, both acute and delayed
after inhalation:
mucous membrane irritation

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breathing difficulty
 coughing
 after resorption:
 irritations
 gastric or intestinal disorders
 after swallowing of large amounts:
 fatigue
 CNS disorders
 ataxia (impaired locomotor coordination)
 drop in temperature
 cramps

· **Indication of any immediate medical attention and special treatment needed:** No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.
- **Special hazards arising from the substance or mixture**
 Formation of toxic gases is possible during heating or in case of fire.
 In case of fire, the following can be released:
 Hydrogen chloride (HCl)
 Sulfur oxides (SO_x)
 Nitrogen oxides (NO_x)
 Ammonia (NH₃)
 Sodium oxide
- **Advice for firefighters**
- **Protective equipment:**
 Wear self-contained respiratory protective device.
 Wear fully protective suit.
- **Additional information**
 Collect contaminated fire fighting water separately. It must not enter the sewage system.
 Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.
 Ambient fire may liberate hazardous vapours.

* 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
 Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:** Do not allow product to reach sewage system or any water course.
- **Methods and material for containment and cleaning up:**
 Dispose contaminated material as waste according to item 13.
 Pick up mechanically.
 Ensure adequate ventilation.
- **Reference to other sections**
 See Section 7 for information on safe handling.
 See Section 8 for information on personal protection equipment.
 See Section 13 for disposal information.

* 7 Handling and storage

- **Precautions for safe handling** Prevent formation of dust.
- **Information about protection against explosions and fires:** The product is not flammable.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
 Store in a cool location.
 Unsuitable material for receptacle: aluminium
 Cu, Pb, Fe
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**
 Protect from heat and direct sunlight.

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- Store in dry conditions.
- Protect from humidity and water.
- This product is hygroscopic.
- Protect from exposure to the light.
- **Recommended storage temperature:** 20 °C +/- 5 °C (approx. 68°F)
- **Storage class:** 6.1 D
- **Specific end use(s)** No further relevant information available.

* 8 Exposure controls/personal protection

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

· Components with limit values that require monitoring at the workplace:

12125-02-9 ammonium chloride (20-30%)

REL (USA)	Short-term value: 20 mg/m ³ Long-term value: 10 mg/m ³
TLV (USA)	Short-term value: 20 mg/m ³ Long-term value: 10 mg/m ³
EL (Canada)	Short-term value: 20 mg/m ³ Long-term value: 10 mg/m ³ fume
EV (Canada)	Short-term value: 20 mg/m ³ Long-term value: 10 mg/m ³ fume

10043-35-3 boric acid (10-20%)

TLV (USA)	Short-term value: 6* mg/m ³ Long-term value: 2* mg/m ³ *as inhalable fraction
EL (Canada)	Short-term value: 6 mg/m ³ Long-term value: 2 mg/m ³
EV (Canada)	Short-term value: 6 mg/m ³ Long-term value: 2 mg/m ³ inorganic, inhalable

- **Additional information:** The lists that were valid during the creation were used as basis.
- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
 - Immediately remove all soiled and contaminated clothing.
 - Wash hands before breaks and at the end of work.
 - Avoid contact with the eyes.
 - Do not eat, drink, smoke or sniff while working.
- **Breathing equipment:** Use respiratory protective device against the effects of fumes/dust/aerosol.
- **Recommended filter device for short term use:** Filter P3
- **Protection of hands:**
 - Preventive skin protection by use of skin-protecting agents is recommended.
 - After use of gloves apply skin-cleaning agents and skin cosmetics.
- **Material of gloves**
 - Nitrile rubber, NBR
 - Recommended thickness of the material: ≥ 0.11 mm
- **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.
 - Value for the permeation: Level ≤ 1 (10 min)
- **Eye protection:** Tightly sealed goggles
- **Body protection:** Protective work clothing

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* 9 Physical and chemical properties

· Information on basic physical and chemical properties	
· Odor Threshold:	Not applicable.
· Appearance:	
Form:	Tablets
Color:	White
· Odor:	Odorless
· pH-value (40.6 g/l) at 20 °C (68 °F):	1.1
· Melting point/Melting range:	Undetermined.
· Boiling point/Boiling range:	300 °C (572 °F)
· Freezing Point:	Not applicable.
· Flash point:	Not applicable.
· Ignition temperature:	400 °C (752 °F) Undetermined.
· Auto igniting:	Product is not selfigniting.
· Danger of explosion:	Product does not present an explosion hazard.
· Specific Gravity:	Not applicable.
· Density at 20 °C (68 °F):	1.967 g/cm ³ (16.415 lbs/gal)
· Vapour density	Not applicable.
· Evaporation rate	Not applicable.
· Solubility in / Miscibility with	
Water:	Soluble.
· Coefficient of Water / Oil Distribution:	Not applicable.
· Solvent content:	
Organic solvents:	0.0 %
Solids content:	100.0 %
· Other information	No further relevant information available.

10 Stability and reactivity

- **Reactivity**
- **Thermal decomposition / conditions to be avoided:** To avoid thermal decomposition do not overheat.
- **Possibility of hazardous reactions**
 - Reacts with alcohols.
 - Forms hydrogen in aqueous solution with metals (Danger of explosion!).
 - Liberates acid in contact with water or alcohol.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:**
 - alkali compounds
 - alkalis
 - acids
 - metals
 - halogen compounds
 - alcohols
 - aluminum
 - chlorine
 - oxidizing agents
- **Hazardous decomposition products:**
 - Sulfur oxides (SO_x)
 - sodium monoxide
 - see chapter 5

* 11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**
 - Quantitative data on the toxicity of the preparation are not available.

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The following statements refer to the individual components.

· LD/LC50 values that are relevant for classification:		
12125-02-9 ammonium chloride		
Oral	LD50	1440 mg/kg (rat) (MERCK)
10043-35-3 boric acid		
Oral	LD50	2660 mg/kg (rat) (GESTIS)
Dermal	LD50	> 2000 mg/kg (rat) (RTECS)
	LD ₀	1500 mg/kg (child) (MERCK)
Inhalative	LC 50	>2.03 mg/l (rat) (MERCK)
	NOAEL	9.6 B mg/kg (rat) (NTP)

- **Primary irritant effect:**
- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Strong irritant with the danger of severe eye injury.
- **Sensitization:** No sensitizing effects known.
- **Subacute to chronic toxicity:**
CAS-No. 10043-35-3:
MERCK: Sensitization test (guinea pig): negative (OECD 406)

- **Additional toxicological information:**
Boric acid:
Absorption: gastro-intestinal tract, mucous membranes

- **Carcinogenic categories**

· IARC (International Agency for Research on Cancer)
None of the ingredients is listed.
· NTP (National Toxicology Program)
None of the ingredients is listed.
· OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients is listed.

- **Carcinogenicity:** NTP? IARC Monographs? OSHA Regulated?
Boric acid:
evaluation for carcinogenicity: negative in animals (NTP)
A4 (not classifiable for humans or animals) by ACGIH
- **Teratogenicity:** Not found.
- **Mutagenicity:**
Boric acid:
Bacterial mutagenicity: Ames Test - negative (IUCLOUD)
Mutagenicity (mammal cell test): chromosome aberration negative (NTP)
- **Reproductive Toxicity:**
Boric acid / Borate may cause developmental changes based on published data, at doses many times in excess of those that could occur through inhalation of dust in occupational settings.
- **Synergistic Products:** None
- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction):**
Product is suspected to cause damage to fertility.
Repr. 1B

*12 Ecological information

- **Toxicity**

· Aquatic toxicity:
12125-02-9 ammonium chloride
EC50 > 100 mg/l/48h (Daphnia magna)

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LC50	209 mg/l/96h (Cyprinus carpio) (IUCLID)
10043-35-3 boric acid	
EC50	133 mg/l/48h (Daphnia magna) (ECOTOX)
LC50	50-100 mg/l/96h (Oncorhynchus mykiss) (ECOTOX)

· **Persistence and degradability** No further relevant information available.

· **Other information:**

Quantitative data on the ecological effect of this mixture are not available.

Methods for the determination of biodegradability are not applicable to inorganic substances.

The following statements refer to the individual components.

Does not cause biological oxygen deficit.

· **Bioaccumulative potential** No further relevant information available.

· **Behavior in environmental systems:**

12125-02-9 ammonium chloride	
log P(o/w)	-4.37 (.)
10043-35-3 boric acid	
log P(o/w)	0.76 (25 °C) (.) (IUCLID)

· **Mobility in soil** No further relevant information available.

· **Ecotoxicological effects:**

· **Remark:**

Toxic for fish:

NH_4^+ > 0.3 mg/l

sulfates > 7 g/l

Forms corrosive mixtures with water even if diluted.

· **Bacterial toxicity:** sulfates toxic > 2.5 g/l

· **Additional ecological information:**

· **General notes:**

Water hazard class 1 (Self-assessment): slightly hazardous for water

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.

· **Results of PBT and vPvB assessment** no further data available

· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**

· **Recommendation:**

Hand over to hazardous waste disposers.

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

· UN-Number	
· DOT, ADR, ADN, IMDG, IATA	none
· UN proper shipping name	
· DOT, ADR, ADN, IMDG	none
· IATA	none

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· Transport hazard class(es)	
· DOT, ADR, ADN, IMDG, IATA	
· Class	none
· Packing group	
· DOT, ADR, IMDG, IATA	none
· Environmental hazards:	
· Marine pollutant:	No
· Special precautions for user	Not applicable.
· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
· Transport/Additional information:	Not dangerous according to the above specifications.
· Canadian TDG Class:	none

*15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- Sara

· Section 355 (Extremely hazardous substances):

None of the ingredients is listed.

· Section 313 (Specific toxic chemical listings):

None of the ingredients is listed.

· TSCA (Toxic Substances Control Act):

All ingredients are listed.

· Proposition 65

· Chemicals known to cause cancer:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

· Canadian Ingredient Disclosure List

· Limit 0,1%

None of the ingredients is listed.

· Limit 1%

7681-38-1 sodium bisulfate

12125-02-9 ammonium chloride

10043-35-3 boric acid

· Canadian Domestic Substances List (DSL)

All ingredients are listed.

· Canadian Non-domestic Substance List

None of the ingredients is listed.

· EPA (Environmental Protection Agency)

10043-35-3 boric acid

I (oral)

· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

· Australian Inventory of Chemical Substances

All ingredients are listed.

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· European EINECS	
All ingredients are listed.	
· Standard for the Uniform Scheduling of Drugs and Poisons	
10043-35-3	boric acid S5

· **Information about limitation of use:**

Employment restrictions concerning pregnant and lactating women must be observed.

Employment restrictions concerning young persons must be observed.

· **This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all of the information required by the CPR**· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.* **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.

· **Relevant phrases**

H302 Harmful if swallowed.

H318 Causes serious eye damage.

H319 Causes serious eye irritation.

H360 May damage fertility or the unborn child.

R22 Harmful if swallowed.

R36 Irritating to eyes.

R41 Risk of serious damage to eyes.

R60 May impair fertility

R61 May cause harm to the unborn child

· **Date of preparation / last revision** 05/13/2014 / 47· **Abbreviations and acronyms:**

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)

ICAO: International Civil Aviation Organization

ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)

EC50: effective concentration, 50 percent (in vivo)

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

DNEL: Derived No-Effect Level (REACH)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

Acute Tox. 4: Acute toxicity, Hazard Category 4

Eye Dam. 1: Serious eye damage/eye irritation, Hazard Category 1

Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2

Repr. 1B: Reproductive toxicity, Hazard Category 1B

· **Sources**

IUCLID (International Uniform Chemical Information Database)

NTP (National Toxicology Program)

Data arise from manufacturers' data sheets, reference works and literature.

· *** Data compared to the previous version altered.**

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* 1 Identification

- **Product identifier**
- **Trade name:** Phosphate HR P2
- **SDS p/n:** 233264-001 Rev. G
- **Part of Thermo Scientific item:** Orion AC2096
- **Relevant identified uses of the substance or mixture and uses advised against:** No further relevant information available.
- **Application of the substance / the mixture:** Reagent for water analysis
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Thermo Fisher Scientific
22 Alpha Road
Chelmsford, MA 01824
USA
phone: 978-232-6000
Made in Germany
- CHEMTREC® 24 hr Emergency: US 800-424-9300; International 703-527-3887

* 2 Hazard(s) identification

- **Classification of the substance or mixture**

US-GHS



GHS06 Skull and crossbones

Acute Tox. 2 H330 Fatal if inhaled.



GHS08 Health hazard

Repr. 1B H360 May damage fertility or the unborn child.

- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**



T; Toxic

R60-61-23: May impair fertility. May cause harm to the unborn child. Toxic by inhalation.

- **Label elements**
- **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms** GHS06, GHS08
- **Signal word** Danger
- **Hazard-determining components of labeling:**
boric acid
ammonium meta-vanadate
- **Hazard statements**
H330 Fatal if inhaled.
H360 May damage fertility or the unborn child.
- **Precautionary statements**
P260 Do not breathe dust.
P308 IF exposed or concerned:
P310 Immediately call a POISON CENTER/doctor.
P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P405 Store locked up.

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Canadian Hazard Symbols:



WHMIS classification:

D2A

Very toxic material causing other toxic effects

D1A

Very toxic material causing immediate and serious toxic effects

NFPA ratings (scale 0 - 4)



Health = 3

Fire = 0

Reactivity = 0

* 3 Composition/information on ingredients

Chemical characterization: Mixtures

Description: mixture of inorganic compounds

Composition and Information on Ingredients:

CAS: 10043-35-3 EINECS: 233-139-2 Index number: 005-007-00-2 RTECS: ED 4550000	boric acid ☠ T Repr. Cat. 2 R60-61 ⚠ Repr. 1B, H360	70-80%
CAS: 5329-14-6 EINECS: 226-218-8 Index number: 016-026-00-0 RTECS: WO 5950000	sulphamidic acid ☠ Xi R36/38 R52/53 ⚠ Skin Irrit. 2, H315; Eye Irrit. 2, H319; Aquatic Chronic 3, H412	2.5-5%
CAS: 7803-55-6 EINECS: 232-261-3 RTECS: YW 0875000	ammonium meta-vanadate ☠ T+ R26; ☠ T R25; ☠ Xi R36/37/38 ⚠ Acute Tox. 3, H301; Acute Tox. 1, H330; ⚠ Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT SE 3, H335	≤ 2.5%

REACH - pre-registered substances All components are REACH pre-registered.

SVHC

10043-35-3 boric acid

Additional information: For the wording of the listed risk phrases refer to section 16.

* 4 First-aid measures

Description of first aid measures

General information:

Immediately remove any clothing soiled by the product.

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

Remove breathing apparatus only after contaminated clothing have been completely removed.

In case of irregular breathing or respiratory arrest provide artificial respiration.

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 wash with water and soap and rinse thoroughly.

Seek immediate medical advice.

After eye contact:

Rinse opened eye for several minutes (15 min) under running water.

Seek immediate medical advice.

After swallowing:

Rinse out mouth and then drink 1-2 glasses of water.

Call a doctor immediately.

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- **Most important symptoms and effects, both acute and delayed**

after inhalation:

headache

sickness

irritations

coughing

after swallowing:

vomiting

diarrhoea

breathing difficulty

unconsciousness

gastric or intestinal disorders

CNS disorders

fatigue

ataxia (impaired locomotor coordination)

cardiovascular disorders

cramps

- **Danger:** Danger of circulatory collapse.

- **Indication of any immediate medical attention and special treatment needed:** No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**

- **Suitable extinguishing agents:**

Fire-extinguishing powder

Sand

- **Special hazards arising from the substance or mixture**

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

Nitrogen oxides (NO_x)Sulphur dioxide (SO₂)

- **Advice for firefighters**

- **Protective equipment:**

Wear self-contained respiratory protective device.

Wear fully protective suit.

- **Additional information**

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

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

* 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**

Wear protective equipment. Keep unprotected persons away.

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

- **Environmental precautions:** Do not allow product to reach sewage system or any water course.

- **Methods and material for containment and cleaning up:**

Dispose contaminated material as waste according to item 13.

Pick up mechanically.

Ensure adequate ventilation.

- **Reference to other sections**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

* 7 Handling and storage

- **Precautions for safe handling**

Ensure good ventilation/exhaustion at the workplace.

Open and handle receptacle with care.

Prevent formation of dust.

Work only in fume cabinet.

- **Information about protection against explosions and fires:** The product is not flammable.

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- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:** Store in a cool location.
- **Information about storage in one common storage facility:**
 - store away from water
 - store away from metals
- **Further information about storage conditions:**
 - Keep receptacle tightly sealed.
 - Protect from heat and direct sunlight.
 - Store in dry conditions.
 - Protect from humidity and water.
 - Protect from exposure to the light.
 - Store under lock and key and with access restricted to technical experts or their assistants only.
- **Recommended storage temperature:** 20 °C +/- 5 °C (approx. 68°F)
- **Storage class:** 6.1 B
- **Specific end use(s)** No further relevant information available.

* 8 Exposure controls/personal protection

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

· Components with limit values that require monitoring at the workplace:

10043-35-3 boric acid (70-80%)

TLV (USA)	Short-term value: 6* mg/m ³ Long-term value: 2* mg/m ³ *as inhalable fraction
EL (Canada)	Short-term value: 6 mg/m ³ Long-term value: 2 mg/m ³
EV (Canada)	Short-term value: 6 mg/m ³ Long-term value: 2 mg/m ³ inorganic, inhalable

- **Additional information:** The lists that were valid during the creation were used as basis.
- **Exposure controls**
- **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.
- **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.
- **Recommended filter device for short term use:** Filter P3
- **Protection of hands:**
 - Preventive skin protection by use of skin-protecting agents is recommended.
 - After use of gloves apply skin-cleaning agents and skin cosmetics.
- **Material of gloves**
 - Nitrile rubber, NBR
 - Recommended thickness of the material: ≥ 0.11 mm
- **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.
 - Value for the permeation: Level ≤ 1 (10 min)
- **Eye protection:** Tightly sealed goggles
- **Body protection:** Protective work clothing

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* 9 Physical and chemical properties

· Information on basic physical and chemical properties	
· Odor Threshold:	Not applicable.
· Appearance:	
Form:	Tablets
Color:	White
· Odor:	Odorless
· pH-value (9.7 g/l) at 20 °C (68 °F):	3.6
· Melting point/Melting range:	Undetermined.
· Boiling point/Boiling range:	300 °C (572 °F)
· Freezing Point:	Not applicable.
· Flash point:	Not applicable.
· Ignition temperature:	Undetermined.
· Auto igniting:	Product is not selfigniting.
· Danger of explosion:	Product does not present an explosion hazard.
· Specific Gravity:	Not applicable.
· Density at 20 °C (68 °F):	1.726 g/cm ³ (14.403 lbs/gal)
· Vapour density	Not applicable.
· Evaporation rate	Not applicable.
· Solubility in / Miscibility with	
Water:	Soluble.
· Coefficient of Water / Oil Distribution:	Not applicable.
· Solvent content:	
Organic solvents:	0.0 %
Solids content:	100.0 %
· Other information	No further relevant information available.

10 Stability and reactivity

- Reactivity
- Thermal decomposition / conditions to be avoided: strong heating
- Possibility of hazardous reactions
 - Forms hydrogen in aqueous solution with metals (Danger of explosion!).
 - Aqueous solution reacts acidic.
- Conditions to avoid No further relevant information available.
- Incompatible materials:
 - acids
 - metals
 - nitrites
- Hazardous decomposition products:
 - Ammonia (NH₃)
 - Nitrogen oxides (NO_x)
 - see chapter 5

* 11 Toxicological information

- Information on toxicological effects
- Acute toxicity:

· LD/LC50 values that are relevant for classification:		
Oral	ATE _(MIX)	2324 mg/kg (rat)
Inhalative	ATE _(MIX)	0.312 mg/l/4h (rat)
10043-35-3 boric acid		
Oral	LD50	2660 mg/kg (rat) (GESTIS)

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Dermal	LD50	> 2000 mg/kg (rat) (RTECS)
	LD ₀	1500 mg/kg (child) (MERCK)
Inhalative	LC 50	>2.03 mg/l (rat) (MERCK)
	NOAEL	9.6 B mg/kg (rat) (NTP)
5329-14-6 sulphamidic acid		
Oral	LD50	3160 mg/kg (rat) (GESTIS)
7803-55-6 ammonium meta-vanadate		
Oral	LD50	58.1 mg/kg (rat) (GESTIS)
Dermal	LD50	2102 mg/kg (rat)
Inhalative	LC50	0.0078 mg/l/4h (rat) (GESTIS)

· **Primary irritant effect:**

· **on the skin:** slight irritations possible

· **on the eye:** irritating effect possible

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

· **Subacute to chronic toxicity:**

CAS-No. 10043-35-3:

MERCK: Sensitization test (guinea pig): negative (OECD 406)

· **Experience with humans:**

Can cause liver damage.

Can cause kidney damages.

· **Additional toxicological information:**

Vanadium and its compounds:

After absorption of toxic quantities changes in the blood picture, loss of weight, cardiovascular complaints

Boric acid:

Absorption: gastro-intestinal tract, mucous membranes

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

None of the ingredients is listed.

· **NTP (National Toxicology Program)**

None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

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

Boric acid:

evaluation for carcinogenicity: negative in animals (NTP)

· **Teratogenicity:** Not found.

· **Mutagenicity:**

Boric acid:

Bacterial mutagenicity: Ames Test - negative (IUCLUD)

Mutagenicity (mammal cell test): chromosome aberration negative (NTP)

· **Reproductive Toxicity:**

Boric acid / Borate may cause developmental changes based on published data, at doses many times in excess of those that could occur through inhalation of dust in occupational settings.

· **Synergistic Products:** None

· **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction):**

Repr. 1B

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12 Ecological information

· Toxicity

· Aquatic toxicity:

10043-35-3 boric acid

EC50 133 mg/l/48h (Daphnia magna)
(ECOTOX)

LC50 50-100 mg/l/96h (Oncorhynchus mykiss)
(ECOTOX)

5329-14-6 sulphamidic acid

LC50 14.2 mg/l/96h (fish)
(GESTIS)

70.3 mg/l/96h (Pimephales promelas)
(MERCK / OECD 203)

7803-55-6 ammonium meta-vanadate

LC50 2.6 mg/l/96h (fish)
(Ecotox)

· **Persistence and degradability** No further relevant information available.

· Other information:

Methods for the determination of biodegradability are not applicable to inorganic substances.

Quantitative data on the ecological effect of this mixture are not available.

Does not cause biological oxygen deficit.

· Bioaccumulative potential

Depending on the concentration, nitrogen compounds may contribute to the eutrophication of water supplies.

· Behavior in environmental systems:

10043-35-3 boric acid

log P(o/w) 0.76 (25 °C) (.)
(IUCLID)

5329-14-6 sulphamidic acid

log P(o/w) 0.10 (.)

· **Mobility in soil** No further relevant information available.

· Ecotoxicological effects:

· Remark:

Toxic for fish:

NH_4^+ > 0.3 mg/l

molybdenum compounds in general: > 25 mg/l

Harmful effect due to pH shift.

· **Algae toxicity:** molybdenum compounds: Sc. quadricauda toxic from 54 mg/l

· **Protozoen:** molybdenum compounds: Microregma toxic from 27 mg/l

· Additional ecological information:

· General notes:

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

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

· **Results of PBT and vPvB assessment** no further data available

· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· Waste treatment methods

· Recommendation:

Hand over to hazardous waste disposers.

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.

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· Recommended cleansing agent: Water, if necessary with cleansing agents.

*14 Transport information

· UN-Number	UN2859
· DOT, ADR, IMDG, IATA	
· UN proper shipping name	Ammonium metavanadate
· DOT / TDG	2859 Ammonium metavanadate
· ADR	AMMONIUM METAVANADATE
· IMDG, IATA	
· Transport hazard class(es)	
· DOT / TDG	
	
· Class	6.1 Toxic substances.
· Label	6.1
· ADR	
	
· Class	6.1 (T5) Toxic substances
· Label	6.1
· IMDG, IATA	
	
· Class	6.1 Toxic substances.
· Label	6.1
· Packing group	
· DOT, ADR, IMDG, IATA	II
· Environmental hazards:	
· Marine pollutant:	No
· Special precautions for user	Warning: Toxic substances
· Danger code (Kemler):	60
· EMS Number:	F-A,S-A
· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
· Transport/Additional information:	
· ADR	
· Limited quantity (LQ):	500 g

*15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- Sara

· Section 355 (Extremely hazardous substances):

None of the ingredients is listed.

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· Section 313 (Specific toxic chemical listings):		
7803-55-6	ammonium meta-vanadate	
· TSCA (Toxic Substances Control Act):		
10043-35-3	boric acid	
5329-14-6	sulphamidic acid	
7803-55-6	ammonium meta-vanadate	
· Proposition 65		
· Chemicals known to cause cancer:		
None of the ingredients is listed.		
· Chemicals known to cause reproductive toxicity for females:		
None of the ingredients is listed.		
· Chemicals known to cause reproductive toxicity for males:		
None of the ingredients is listed.		
· Chemicals known to cause developmental toxicity:		
None of the ingredients is listed.		
· Canadian Ingredient Disclosure List		
· Limit 0,1%		
None of the ingredients is listed.		
· Limit 1%		
molybdenum compounds, n.o.s.		
All ingredients are listed.		
· Canadian Domestic Substances List (DSL)		
Substance is not listed.		
10043-35-3	boric acid	
5329-14-6	sulphamidic acid	
7803-55-6	ammonium meta-vanadate	
· Canadian Non-domestic Substance List		
None of the ingredients is listed.		
· EPA (Environmental Protection Agency)		
10043-35-3	boric acid	I (oral)
· NIOSH-Ca (National Institute for Occupational Safety and Health)		
None of the ingredients is listed.		
· Australian Inventory of Chemical Substances		
All ingredients are listed.		
· European EINECS		
All ingredients are listed.		
· Standard for the Uniform Scheduling of Drugs and Poisons		
10043-35-3	boric acid	S5
5329-14-6	sulphamidic acid	S5, S6
· Information about limitation of use:		
Employment restrictions concerning pregnant and lactating women must be observed.		
Employment restrictions concerning young persons must be observed.		
· This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all of the information required by the CPR		
·		
·		
· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.		

*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.

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· Relevant phrases

H301	Toxic if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H335	May cause respiratory irritation.
H360	May damage fertility or the unborn child.
H412	Harmful to aquatic life with long lasting effects.
R25	Toxic if swallowed.
R26	Very toxic by inhalation.
R36/37/38	Irritating to eyes, respiratory system and skin.
R36/38	Irritating to eyes and skin.
R52/53	Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R60	May impair fertility
R61	May cause harm to the unborn child

· **Date of preparation / last revision** 05/14/2014 / 49

· Abbreviations and acronyms:

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
 IATA-DGR: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
 ICAO: International Civil Aviation Organization
 ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
 EC50: effective concentration, 50 percent (in vivo)
 ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
 IMDG: International Maritime Code for Dangerous Goods
 DOT: US Department of Transportation
 IATA: International Air Transport Association
 EINECS: European Inventory of Existing Commercial Chemical Substances
 ELINCS: European List of Notified Chemical Substances
 CAS: Chemical Abstracts Service (division of the American Chemical Society)
 NFPA: National Fire Protection Association (USA)
 WHMIS: Workplace Hazardous Materials Information System (Canada)
 LC50: Lethal concentration, 50 percent
 LD50: Lethal dose, 50 percent
 Acute Tox. 3: Acute toxicity, Hazard Category 3
 Acute Tox. 1: Acute toxicity, Hazard Category 1
 Acute Tox. 2: Acute toxicity, Hazard Category 2
 Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
 Eye Irrit. 2: Serious eye damage/eye irritation, Hazard Category 2
 Eye Irrit. 2A: Serious eye damage/eye irritation, Hazard Category 2A
 Repr. 1B: Reproductive toxicity, Hazard Category 1B
 STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3
 Aquatic Chronic 3: Hazardous to the aquatic environment - Chronic Hazard, Category 3

· Sources

NTP (National Toxicology Program)
 International Chemical Safety Cards (ICSCs)
 Data arise from manufacturers' data sheets, reference works and literature.

· *** Data compared to the previous version altered.**

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