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1 Identification

· **Product identifier**

· **Trade name: FIVE ELEMENT A/S STD CAL 4**
· **Article number** N9300221
· **Application of the substance / the mixture** Laboratory chemicals

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**

PerkinElmer, Inc.
710 Bridgeport Avenue
Shelton, Connecticut 06484 USA
CustomerCareUS@perkinelmer.com
203-925-4600
· **Emergency telephone number:**
CHEMTREC (within US) 800-424-9300
CHEMTREC (from outside US) +1 703-527-3887 (call collect)
CHEMTREC (within AU) +(61)-290372994

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2 Hazard(s) identification

· **Classification of the substance or mixture**

Corrosion

Skin Corr. 1B H314 Causes severe skin burns and eye damage.
Eye Dam. 1 H318 Causes serious eye damage.

· **Label elements**
· **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms** GHS05
· **Signal word** Danger

· **Hazard-determining components of labeling:**
Nitric Acid
· **Hazard statements**
H314 Causes severe skin burns and eye damage.
· **Precautionary statements**

P260	Do not breathe dusts or mists.
P264	Wash thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	If swallowed: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
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.
P321	Specific treatment (see on this label).
P363	Wash contaminated clothing before reuse.
P405	Store locked up.

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P501 *Dispose of contents/container in accordance with local/regional/national/international regulations.*

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 3
Fire = 0
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**

Health = 3
Fire = 0
Reactivity = 0

· **Other hazards**
The product does not contain any organic halogen compounds (AOX), nitrates, heavy metal compounds or formaldehydes.
· **Results of PBT and vPvB assessment**
· **PBT:** *Not applicable.*
· **vPvB:** *Not applicable.*

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3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
7732-18-5 Water
· **Identification number(s)**
· **EC number:** *231-791-2*
· **Chemical characterization: Mixtures**
· **Description:** *Mixture of the substances listed below with nonhazardous additions.*

· **Hazardous components:**			
7697-37-2	*Nitric Acid*	*Ox. Liq. 2, H272* *Skin Corr. 1A, H314*	*5.0%*

· **Additional Components**		
7440-28-0	*thallium* *Acute Tox. 2, H300; Acute Tox. 2, H330* *STOT RE 2, H373*	*0.01%*
7440-38-2	*Arsenic* *Acute Tox. 3, H301; Acute Tox. 3, H331* *Carc. 1A, H350*	*0.01%*
7782-49-2	*selenium* *Acute Tox. 3, H301; Acute Tox. 3, H331* *STOT RE 2, H373*	*0.005%*
7439-92-1	*lead* *Acute Tox. 3, H301* *Carc. 2, H351; Repr. 1A, H360-H362* *Acute Tox. 4, H332*	*0.005%*

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7440-43-9	cadmium (non-pyrophoric) Acute Tox. 2, H330 Muta. 2, H341; Carc. 1B, H350; Repr. 2, H361; STOT RE 1, H372	0.005%
7732-18-5	Water	94.965%

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4 First-aid measures

· **Description of first aid measures**
· **General information:** Immediately remove any clothing soiled by the product.
· **After inhalation:** In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:** Immediately wash with water and soap and rinse thoroughly.
· **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.
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.
· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

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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**
During heating or in case of fire poisonous gases are produced.
· **Advice for firefighters**
· **Protective equipment:** Mouth respiratory protective device.

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6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
· **Environmental precautions:**
Inform respective authorities in case of seepage into water course or sewage system.
Dilute with plenty of water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Use neutralizing agent.
Dispose contaminated material as waste according to item 13.
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.
· **Protective Action Criteria for Chemicals**

· **PAC-1:**		
7697-37-2	Nitric Acid	0.16 ppm

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7440-28-0	thallium	0.06 mg/m³
7440-38-2	Arsenic	1.5 mg/m³
7782-49-2	selenium	0.6 mg/m³
7439-92-1	lead	0.15 mg/m³
7440-43-9	cadmium (non-pyrophoric)	0.10 mg/m³

· **PAC-2:**

7697-37-2	Nitric Acid	24 ppm
7440-28-0	thallium	3.3 mg/m³
7440-38-2	Arsenic	17 mg/m³
7782-49-2	selenium	6.6 mg/m³
7439-92-1	lead	120 mg/m³
7440-43-9	cadmium (non-pyrophoric)	0.76 mg/m³

· **PAC-3:**

7697-37-2	Nitric Acid	92 ppm
7440-28-0	thallium	20 mg/m³
7440-38-2	Arsenic	100 mg/m³
7782-49-2	selenium	40 mg/m³
7439-92-1	lead	700 mg/m³
7440-43-9	cadmium (non-pyrophoric)	4.7 mg/m³

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7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:** Keep respiratory protective device available.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:** Keep receptacle tightly sealed.
· **Specific end use(s)** No further relevant information available.

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8 Exposure controls/personal protection

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

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· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
7697-37-2 Nitric Acid	
PEL	Long-term value: 5 mg/m³, 2 ppm
REL	Short-term value: 10 mg/m³, 4 ppm Long-term value: 5 mg/m³, 2 ppm
TLV	Short-term value: 10 mg/m³, 4 ppm Long-term value: 5.2 mg/m³, 2 ppm

· **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.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.
· **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:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· **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.
· **Penetration time of glove material**
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **Eye protection:**

Tightly sealed goggles or safety glasses

· **Body protection:** Apron

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9 Physical and chemical properties

· **Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Liquid
Color:	Transparent
· **Odor:**	Characteristic
· **Odor threshold:**	Not determined.
· **pH-value:**	Not determined.
· **Change in condition**	
Melting point/Melting range:	0 °C (32 °F)
Boiling point/Boiling range:	100 °C (212 °F)
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Not applicable.
· **Decomposition temperature:**	Not determined.
· **Auto igniting:**	Product is not selfigniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure at 20 °C (68 °F):**	23 hPa (17.3 mm Hg)
· **Density at 20 °C (68 °F):**	1 g/cm³ (8.345 lbs/gal)
· **Relative density**	Not determined.
· **Vapor density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with**	
Water:	Fully miscible.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Solvent content:**	
Water:	95.0 %
VOC content:	0.00 %
· **Other information**	No further relevant information available.

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10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

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· ***Possibility of hazardous reactions*** *No dangerous reactions known.*
· ***Conditions to avoid*** *No further relevant information available.*
· ***Incompatible materials:*** *No further relevant information available.*
· ***Hazardous decomposition products:*** *No dangerous decomposition products known.*

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11 Toxicological information

· ***Information on toxicological effects***
· ***Acute toxicity:***
· ***Primary irritant effect:***
· ***on the skin:*** *Caustic effect on skin and mucous membranes.*
· ***on the eye:***
Strong caustic effect.
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:
Corrosive
Irritant
Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

· ***Carcinogenic categories***

· ***IARC (International Agency for Research on Cancer)***		
7440-38-2	*Arsenic*	*1*
7782-49-2	*selenium*	*3*
7439-92-1	*lead*	*2B*
7440-43-9	*cadmium (non-pyrophoric)*	*1*

· ***NTP (National Toxicology Program)***		
7440-38-2	*Arsenic*	*K*
7439-92-1	*lead*	*R*
7440-43-9	*cadmium (non-pyrophoric)*	*K*

· ***OSHA-Ca (Occupational Safety & Health Administration)***	
7440-38-2	*Arsenic*
7440-43-9	*cadmium (non-pyrophoric)*

*
12 Ecological information

· ***Toxicity***
· ***Aquatic toxicity:*** *No further relevant information available.*
· ***Persistence and degradability*** *No further relevant information available.*
· ***Behavior in environmental systems:***
· ***Bioaccumulative potential*** *No further relevant information available.*
· ***Mobility in soil*** *No further relevant information available.*

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· **Additional ecological information:**
· **General notes:**
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**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

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13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:**
Dispose of container and materials in accordance with local, regional and national regulations.

· **Uncleaned packagings:**
· **Recommendation:** Disposal must be made according to official regulations.
· **Recommended cleansing agent:** Water, if necessary with cleansing agents.

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14 Transport information

· **UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN3264
· **UN proper shipping name**	
· **DOT**	Corrosive liquid, acidic, inorganic, n.o.s.
· **ADR**	3264 Corrosive liquid, acidic, inorganic, n.o.s. (Nitric Acid) CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric Acid solution)
· **IMDG**	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric Acid), MARINE POLLUTANT
· **IATA**	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Nitric Acid)
· **Transport hazard class(es)**	
· **DOT**	

· **Class**	8 Corrosive substances
· **Label**	8
· **ADR**	

· **Class**	8 (C1) Corrosive substances

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· **Label**	8
· **IMDG**	
	
· **Class**	8 Corrosive substances
· **Label**	8
· **IATA**	
	
· **Class**	8 Corrosive substances
· **Label**	8
· **Packing group**	
· **DOT, ADR, IMDG, IATA**	III
· **Environmental hazards:**	
· **Marine pollutant:**	No Symbol (fish and tree)
· **Special precautions for user**	Warning: Corrosive substances
· **Danger code (Kemler):**	80
· **EMS Number:**	F-A,S-B
· **Segregation groups**	Acids
· **Stowage Category**	A
· **Stowage Code**	SW2 Clear of living quarters.
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Quantity limitations**	On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L
· **Remarks:**	Special marking with the symbol (fish and tree).
· **ADR**	
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· **IMDG**	
· **Limited quantities (LQ)**	5L
· **Excepted quantities (EQ)**	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml

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· **UN "Model Regulation":** UN 3264 CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (NITRIC ACID), 8, III

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15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**

7732-18-5	Water		94.965%
7697-37-2	Nitric Acid	Ox. Liq. 2, H272 Skin Corr. 1A, H314	5.0%
7440-38-2	Arsenic	Acute Tox. 3, H301; Acute Tox. 3, H331 Carc. 1A, H350	0.01%

· **Sara**

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

7697-37-2	Nitric Acid

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

7697-37-2	Nitric Acid
7440-28-0	thallium
7440-38-2	Arsenic
7782-49-2	selenium
7439-92-1	lead
7440-43-9	cadmium (non-pyrophoric)

· **TSCA (Toxic Substances Control Act):**
All ingredients are listed.

7697-37-2	Nitric Acid
7440-28-0	thallium
7440-38-2	Arsenic
7782-49-2	selenium
7439-92-1	lead
7440-43-9	cadmium (non-pyrophoric)
7732-18-5	Water

· **Proposition 65**

· **Chemicals known to cause cancer:**

7440-38-2	Arsenic
7439-92-1	lead
7440-43-9	cadmium (non-pyrophoric)

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

7439-92-1	lead

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

7439-92-1	lead
7440-43-9	cadmium (non-pyrophoric)

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· **Chemicals known to cause developmental toxicity:**	
7439-92-1	lead
7440-43-9	cadmium (non-pyrophoric)

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**		
7440-38-2	Arsenic	A
7782-49-2	selenium	D
7439-92-1	lead	B2
7440-43-9	cadmium (non-pyrophoric)	B1

· **TLV (Threshold Limit Value established by ACGIH)**		
7440-38-2	Arsenic	A1
7439-92-1	lead	A3
7440-43-9	cadmium (non-pyrophoric)	A2

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**	
7440-38-2	Arsenic
7440-43-9	cadmium (non-pyrophoric)

· **National regulations:**

· **Information about limitation of use:**
Workers are not allowed to be exposed to this hazardous material. Exceptions can be made by the authorities in certain cases.

· **Water hazard class:** Water hazard class 1 (Self-assessment): slightly hazardous for water.
· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

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16 Other information

Disclaimer
The information provided in this Material Safety Data Sheet is based on our present knowledge, and believed to be correct at the date of publication. However, no representation is made concerning its accuracy and completeness. It is intended as guidance only, and is not to be considered a warranty or quality specification. All materials may present unknown hazards, and should be used with caution. Although certain hazards are described, we cannot guarantee that these are the only hazards which exist. PerkinElmer shall not be held liable for any damage resulting from handling or from contact with the product.

· **Department issuing SDS:** Environmental, Health and Safety
· **Contact:**
Within the USA: 1-(800)-762-4000
Outside the USA: 1-(203)-712-8488
· **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)
ICAO: International Civil Aviation Organisation
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

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IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
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)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Ox. Liq. 2: Oxidizing liquids – Category 2
Skin Corr. 1A: Skin corrosion/irritation – Category 1A
Skin Corr. 1B: Skin corrosion/irritation – Category 1B
Eye Dam. 1: Serious eye damage/eye irritation – Category 1

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