SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name **Potassium dichromate**

Stock number: A18722

CAS Number: 7778-50-9

EC number: 231-906-6

Index number: 024-002-00-6

1.2 Relevant identified uses of the substance or mixture and uses advised against.

Identified use: SU24 Scientific research and development

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier:

Alfa Aesar
Avocado Research Chemicals, Ltd.
Shore Road
Port of Heysham Industrial Park
Heysham Lancashire LA3 2XY
United Kingdom

Office Tel: +44 (0) 1524 850506
Office Fax: +44 (0) 1524 850608
Email: uktech@alfa.com

Informing department: Product safety department.

1.4 Emergency telephone number:

Call Carechem 24 at +44 (0) 1865 407333 (English only); +44 (0) 1235 239670 (Multi-language)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

<table>
<thead>
<tr>
<th>GHS03 flame over circle</th>
<th>GHS05 corrosion</th>
<th>GHS06 skull and crossbones</th>
<th>GHS08 health hazard</th>
<th>GHS09 environment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ox. Sol. 2 H272</td>
<td>H314</td>
<td>H330</td>
<td>May intensify fire; oxidiser.</td>
<td>Causes severe skin burns and eye damage.</td>
</tr>
<tr>
<td>Acute Tox. 3 H301</td>
<td>H312</td>
<td>H334</td>
<td>Toxic if swallowed.</td>
<td>Very toxic to aquatic life.</td>
</tr>
<tr>
<td>Acute Tox. 2 H301</td>
<td>H330</td>
<td>H334</td>
<td>Fatal if inhaled.</td>
<td>Very toxic to aquatic life with long lasting effects.</td>
</tr>
<tr>
<td>GHS08 health hazard</td>
<td></td>
<td>H334</td>
<td>May cause allergy or asthma symptoms or breathing difficulties if inhaled.</td>
<td></td>
</tr>
<tr>
<td>Muta. 1B H340</td>
<td></td>
<td>H350</td>
<td>May cause genetic defects.</td>
<td></td>
</tr>
<tr>
<td>Carc. 1B H350</td>
<td></td>
<td>H350</td>
<td>May cause cancer.</td>
<td></td>
</tr>
<tr>
<td>Repir. 1B H360FD</td>
<td></td>
<td>H372</td>
<td>May damage fertility. May damage the unborn child.</td>
<td></td>
</tr>
<tr>
<td>STOT RE 1 H372</td>
<td></td>
<td></td>
<td>Causes damage to the lung, the kidneys, the liver, the heart, the reproductive system, the blood, the bladder and the endocrine system system through prolonged or repeated exposure. Route of exposure: Oral.</td>
<td></td>
</tr>
</tbody>
</table>

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008

The substance is classified and labelled according to the CLP regulation.

Hazard pictograms

GHS03 GHS05 GHS06 GHS08 GHS09

Signal word Danger

Hazard statements

H272 May intensify fire; oxidiser.
H301 Toxic if swallowed.
H312 Fatal in contact with skin.
H330 Causes severe skin burns and eye damage.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317 May cause an allergic skin reaction.
H340 May cause genetic defects.
H350 May cause cancer.
H360FD May damage fertility. May damage the unborn child.
H372 Causes damage to the lung, the kidneys, the liver, the heart, the reproductive system, the blood, the bladder and the endocrine system system through prolonged or repeated exposure. Route of exposure: Oral.
H410 Very toxic to aquatic life with long lasting effects.

(Contd. on page 2)
Precautionary statements

P221 Take any precaution to avoid mixing with combustibles.
P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P320 Specific treatment is urgent (see on this label).
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 3: Composition/information on ingredients

3.1 Substances
CAS# Designation:
7778-50-9 Potassium dichromate
Concentration: ≤100%
Identification number(s):
EC number: 231-906-6
Index number: 024-002-00-6

SECTION 4: First aid measures

4.1 Description of first aid measures
General information
Instantly remove any clothing soiled by the product. Remove breathing apparatus only after soiled clothing has been completely removed. In case of irregular breathing or respiratory arrest provide artificial respiration.
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist. Seek immediate medical advice.
After skin contact
Instantly wash with water and soap and rinse thoroughly. Seek immediate medical advice.
After eye contact
Rinse opened eye for several minutes under running water. Then consult doctor.
After swallowing Do not induce vomiting; instantly call for medical help.

4.2 Most important symptoms and effects, both acute and delayed
Causes severe skin burns. Harmful in contact with skin. Fatal if inhaled. Toxic if swallowed. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. May cause cancer. May cause genetic defects. May damage fertility or the unborn child. Causes damage to the lung, the kidneys, the liver, the heart, the reproductive system, the blood, the bladder and the endocrine system system through prolonged or repeated exposure. Route of exposure: Oral.

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

SECTION 5: Firefighting measures

5.1 Extinguishing media
Suitable extinguishing agents CO2, extinguishing powder or water jet. Fight larger fires with water jet or alcohol-resistant foam.
For safety reasons unsuitable extinguishing agents Halocarbon extinguisher
This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.
If this product is involved in a fire, the following can be released:
Potassium oxide
Chromium oxides

5.3 Advice for firefighters
Protective equipment:
Wear self-contained breathing apparatus. Wear full protective suit.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
6.2 Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.
6.3 Methods and material for containment and cleaning up:
Use neutralising agent. Dispose of contaminated material as waste according to section 13. Ensure adequate ventilation. Prevention of secondary hazards:
Acts as an oxidizing agent on organic materials such as wood, paper and fats
Keep away from combustible material.

6.4 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 information on disposal.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Keep containers tightly sealed.
Store in cool, dry place in tightly closed containers. Ensure good ventilation/exhaustion at the workplace. Open and handle container with care.
Only handle and refill product in closed systems.
Information about protection against explosions and fires:
Substance/product can reduce the ignition temperature of flammable substances. This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition.
7.2 Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and containers: No special requirements.
Information about storage in one common storage facility:
Store away from flammable substances.
Store away from reducing agents.
Do not store with organic materials.
Store away from metal powders.
Do not store together with acids.

Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Store in a locked cabinet or with access restricted to technical experts or their assistants.

7.3 Specific end use(s) No further relevant information available.

SECTION 8: Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

8.1 Control parameters
Components with critical values that require monitoring at the workplace:
BMGV: Chromium VI; 10 µmol chromium/mol creatine in urine (sample post shift)

Ingredients with biological limit values:

7778-50-9 Potassium dichromate (100.0%)

Additional information:
No data

8.2 Exposure controls

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures should be adhered to in handling the chemicals.
Keep away from foodstuffs, beverages and food.
Instantly remove any soiled and impregnated garments.
Wash hands during breaks and at the end of the work.

Breathing equipment:
Respiratory protection equipment should be worn and maintained according to the suppliers specifications. Fit testing must be conducted at regular intervals.
Use self-contained respiratory protective device in emergency situations.

Recommended filter device for short term use
Use a respirator with type P100 (USA) or P3 (EN 143) cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards.

Protection of hands:
Check protective gloves prior to each use for their proper condition.
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.

Material of gloves
Nitrile rubber, NBR
Penetration time of glove material (in minutes) 480
Glove thickness: 0.11 mm
Eye protection:
Tightly sealed safety glasses.
Full face protection
Safety glasses with side shields / NIOSH (US) or EN 166(EU)

Body protection:
Protective work clothing.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties
General Information
Appearance: Crystalline powder
Odour: Odourless
Odour threshold: Not determined.

pH-value: Not applicable.

Change in condition
Melting point/freezing point: 398 °C
Initial boiling point and boiling range: Not determined
Sublimation temperature / start: Not determined
Inflammability (solid, gaseous) Contact with combustible material may cause fire.
Ignition temperature: Not determined
Decomposition temperature: Not determined
Self-inflammability: Not determined.

Explosive properties:
Critical values for explosion:
Lower: Not determined
Upper: Not determined

Steam pressure at 20 °C: 0 hPa
Density at 20 °C 2.676 g/cm³
Relative density Not determined.
Vapour density Not applicable.
Evaporation rate Not applicable.

Solubility in / Miscibility with
Water at 20 °C: 125 g/l
Partition coefficient: n-octanol/water: Not determined.
Viscosity:
dynamic: Not applicable.

9.2 Other information
No further relevant information available.

SECTION 10: Stability and reactivity

10.1 Reactivity
May intensify fire; oxidiser.

10.2 Chemical stability
Stable under recommended storage conditions.
**Trade name** Potassium dichromate

**Thermal decomposition / conditions to be avoided:** No decomposition if used and stored according to specifications.

**10.3 Possibility of hazardous reactions**
Reacts with reducing agents
Reacts with flammable substances

**10.4 Conditions to avoid** No further relevant information available.

**10.5 Incompatible materials:**
Acids
Reducing agents
Flammable substances
Organic materials
Metal powders

**10.6 Hazardous decomposition products:**
Potassium oxide
Chromium oxides

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**SECTION 11: Toxicological information**

**11.1 Information on toxicological effects**

**Acute toxicity**
Harmful in contact with skin.
Harmful in contact with skin.
Fatal if inhaled.
Toxic if swallowed.
Danger by skin resorption.
Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for this substance.
Toxic if swallowed.
Harmful in contact with skin.
Fatal if inhaled.

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

Oral (LD50) 25 mg/kg (rat)

**Skin irritation or corrosion:**
Causes severe skin burns.
Causes severe skin burns and eye damage.
Causes serious eye damage.
Causes severe skin burns and eye damage.

**Eye irritation or corrosion:**
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.

**Germ cell mutagenicity:**
May cause genetic defects.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for this substance.

**Carcinogenicity:**
May cause cancer.
May cause cancer.
IARC-1: Carcinogenic to humans: sufficient evidence of carcinogenicity.

**Reproductive toxicity:**
May damage fertility or the unborn child.

**Specific target organ system toxicity - repeated exposure:**
Causes damage to the lung, the kidneys, the liver, the heart, the reproductive system, the blood, the bladder and the endocrine system system through prolonged or repeated exposure. Route of exposure: Oral.

**Specific target organ system toxicity - single exposure:**
No effects known.

**Aspiration hazard:** No effects known.

**Subacute to chronic toxicity:** The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.

**Additional toxicological information:** To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

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**SECTION 12: Ecological information**

**12.1 Toxicity**
Aquatic toxicity: No further relevant information available.

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

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

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

**Ecotoxicological effects:**
**Remark:** Very toxic for fish

**Additional ecological information:**

**General notes:**
Do not allow material to be released to the environment without proper governmental permits.
Water danger class 3 (Assessment by list): extremely hazardous for water.
Do not allow product to reach ground water, water bodies or sewage system, even in small quantities.

**Ecotoxicological effects:**
**Remark:** Very toxic for aquatic organisms

**12.5 Results of PBT and vPvB assessment**
PBT: Not applicable.
vPvB: Not applicable.

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

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**SECTION 13: Disposal considerations**

**13.1 Waste treatment methods**
Recommendation: Hand over to disposers of hazardous waste.
Must be specially treated under adherence to official regulations.
Consult state, local or national regulations for proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
SECTION 14: Transport information

UN-Number
ADR, IMDG, IATA
UN3087

14.2 UN proper shipping name
ADR
IMDG, IATA
3087 OXIDIZING SOLID, TOXIC, N.O.S. (Potassium dichromate)
OXIDIZING SOLID, TOXIC, N.O.S. (Potassium dichromate)

14.3 Transport hazard class(es)
ADR

Class
Label
5.1 (OT2) Oxidising substances.
5.1+6.1

IMDG

Class
Label
5.1 Oxidising substances.
5.1/6.1

IATA

Class
Label
5.1 Oxidising substances.
5.1 (6.1)

Packing group
ADR, IMDG, IATA
II

14.5 Environmental hazards:
Environmentally hazardous substance, solid

14.6 Special precautions for user
Warning: Oxidising substances.
Kemler Number:
56
EMS Number:
F-A-S-Q
Stowage Category
B
Segregation Code
SG38 Stow "separated from" ammonium compounds.
SG49 Stow "separated from" cyanides
SG60 Stow "separated from" peroxides

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code
Not applicable.

Transport/Additional information:
ADR

Excepted quantities (EQ):
1 kg
Code: E2
Maximum net quantity per inner packaging: 30 g
Maximum net quantity per outer packaging: 500 g

Transport category
2
Tunnel restriction code
E

IMDG

Limited quantities (LQ)
1 kg
Code: E2
Maximum net quantity per inner packaging: 30 g
Maximum net quantity per outer packaging: 500 g

UN "Model Regulation":
UN 3087 OXIDIZING SOLID, TOXIC, N.O.S. (POTASSIUM DICHROMATE), 5.1 (6.1), II

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Australian Inventory of Chemical Substances Substance is listed.
Standard for the Uniform Scheduling of Medicines and Poisons Substance is not listed.
Directive 2012/18/EU Named dangerous substances - ANNEX I Substance is not listed.
Seveso category
H2 ACUTE TOXIC
P8 OXIDISING LIQUIDS AND SOLIDS
E1 Hazardous to the Aquatic Environment
Qualifying quantity (tonnes) for the application of lower-tier requirements 50 t
Qualifying quantity (tonnes) for the application of upper-tier requirements 200 t

LIST OF SUBSTANCES SUBJECT TO AUTHORISATION (ANNEX XIV)

7778-50-9 Potassium dichromate

REGULATION (EC) No 1907/2006 ANNEX XVII Conditions of restriction: 28, 29, 30, 47
National regulations
Information about limitation of use:
Workers should not be exposed to this hazardous material. Exceptions can be made by the authorities in certain exceptional cases. Employment restrictions concerning young persons must be observed. Employment restrictions concerning women of child-bearing age must be observed. For use only by technically qualified individuals.
Classification according to VbF: Not applicable
Water hazard class: Water danger class 3 (Assessment by list): extremely hazardous for water.
Other regulations, limitations and prohibitive regulations
ELINCS (European List of Notified Chemical Substances) Substance is not listed.
Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006. This substance is included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH). The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
Substance is not listed.
Annex XIV of the REACH Regulations (requiring Authorisation for use) Substance is listed.

15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.
SECTION 16: Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department

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
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VfH: Verordnung über brennbare Flüssigkeiten, Österreich (Ordinance on the storage of combustible liquids, Austria)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety and Health Administration (USA)
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Ox. Sol. 2: Oxidizing solids – Category 2
Acute Tox. 3: Acute toxicity – Category 3
Resp. Sens. 1: Respiratory sensitisation – Category 1
STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1
Aquatic Acute 1: Hazardous to the aquatic environment – acute aquatic hazard – Category 1
Aquatic Chronic 1: Hazardous to the aquatic environment - long-term aquatic hazard – Category 1