



Safety Data Sheet

acc. to OSHA HCS

Printing date 02/27/2023

Revision date 02/27/2023

1 Identification

- **Product identifier**
- **Trade name: AMPK Complex (α 1, β 1, and γ 1 subunits; human, recombinant)**
- **Article number:** 32557
- **Application of the substance / the mixture**
This product is for research use - Not for human or veterinary diagnostic or therapeutic use.
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Cayman Chemical Co.
1180 E. Ellsworth Rd.
Ann Arbor, MI 48108
USA
- **Information department:** Product safety department
- **Emergency telephone number:**
During normal opening times: +1 (734) 971-3335
US/CANADA: 800-424-9300
Outside US/CANADA: 703-741-5970

2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS08 Health hazard

Toxic to Reproduction 1B

H360 May damage fertility or the unborn child.

Specific Target Organ Toxicity - Repeated Exposure
2H373 May cause damage to organs through
prolonged or repeated exposure.

GHS07

Skin Irritation 2

H315 Causes skin irritation.

Eye Irritation 2A

H319 Causes serious eye irritation.

- **Label elements**
- **GHS label elements**

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

(Contd. on page 2)

US

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/27/2023

Revision date 02/27/2023

Trade name: AMPK Complex (α 1, β 1, and γ 1 subunits; human, recombinant)

(Contd. from page 1)

- **Hazard pictograms**



GHS07 GHS08

- **Signal word** Danger

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

Imidazole

Sodium chloride

- **Hazard statements**

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H360 May damage fertility or the unborn child.

H373 May cause damage to organs through prolonged or repeated exposure.

- **Precautionary statements**

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P260 Do not breathe dust/fume/gas/mist/vapors/spray.

P264 Wash thoroughly after handling.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P302+P352 If on skin: Wash with plenty of water.

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

P308+P313 IF exposed or concerned: Get medical advice/attention.

P321 Specific treatment (see on this label).

P314 Get medical advice/attention if you feel unwell.

P362+P364 Take off contaminated clothing and wash it before reuse.

P332+P313 If skin irritation occurs: Get medical advice/attention.

P337+P313 If eye irritation persists: Get medical advice/attention.

P405 Store locked up.

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

- **Classification system:**

- **NFPA ratings (scale 0 - 4)**



Health = 2

Fire = 1

Reactivity = 0

- **HMIS-ratings (scale 0 - 4)**



Health = *2

Fire = 1

Reactivity = 0

- **Other hazards**

- **Results of PBT and vPvB assessment**

- **PBT:** Not applicable.

- **vPvB:** Not applicable.

US

(Contd. on page 3)

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/27/2023

Revision date 02/27/2023

Trade name: AMPK Complex (α 1, β 1, and γ 1 subunits; human, recombinant)

(Contd. from page 2)

3 Composition/information on ingredients

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

- **Dangerous components:**

| | | |
|------------------------------------|-----------------|-------|
| CAS: 56-81-5 RTECS: MA8050000 | Glycerol | 25.0% |
| CAS: 7647-14-5 RTECS: VZ4725000 | Sodium chloride | 1.75% |
| CAS: 288-32-4 RTECS: NI3325000 | Imidazole | 1.02% |

- **Other ingredients**

| | | |
|------------------------------------|---------------------|-------|
| CAS: 7732-18-5 RTECS: ZC0110000 | Water | 71.3% |
| CAS: 7601-54-9 | trisodium phosphate | 0.82% |
| | Protein | 0.1% |
| CAS: 3483-12-3 RTECS: EK1610000 | DL-Dithiothreitol | 0.01% |

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.
- **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. If symptoms persist, consult a doctor.
- **After swallowing:** If symptoms persist consult doctor.
- **Information for 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.

5 Fire-fighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
Use fire fighting measures that suit the environment.
A solid water stream may be inefficient.
- **Special hazards arising from the substance or mixture**
67-56-1 During heating or in case of fire poisonous gases are produced.
- **Advice for firefighters**
- **Protective equipment:** Mouth respiratory protective device.

US

(Contd. on page 4)

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/27/2023

Revision date 02/27/2023

Trade name: AMPK Complex (α 1, β 1, and γ 1 subunits; human, recombinant)

(Contd. from page 3)

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
Mount respiratory protective device.
- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
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:**

| | | |
|----------|-----------|------------------------|
| 56-81-5 | Glycerol | 45 mg/m ³ |
| 288-32-4 | Imidazole | 0.66 mg/m ³ |

- **PAC-2:**

| | | |
|----------|-----------|-----------------------|
| 56-81-5 | Glycerol | 180 mg/m ³ |
| 288-32-4 | Imidazole | 7.3 mg/m ³ |

- **PAC-3:**

| | | |
|----------|-----------|-------------------------|
| 56-81-5 | Glycerol | 1,100 mg/m ³ |
| 288-32-4 | Imidazole | 44 mg/m ³ |

7 Handling and storage

- **Handling:**
- **Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
- **Information about protection against explosions and fires:**
Keep respiratory protective device available.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:** Store in accordance with information listed on the product insert.
- **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.

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:**
The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
At this time, the other constituents have no known exposure limits.

(Contd. on page 5)

-US

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/27/2023

Revision date 02/27/2023

Trade name: AMPK Complex (α 1, β 1, and γ 1 subunits; human, recombinant)

(Contd. from page 4)

56-81-5 Glycerol

| | |
|-----|---|
| PEL | Long-term value: 15* 5** mg/m ³ mist; *total dust **respirable fraction |
| TLV | TLV withdrawn-insufficient data human occup. exp. |

- **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.
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. Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture. 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 through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection:**



Tightly sealed goggles

9 Physical and chemical properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**
 - Form:** Solid
 - Color:** Not determined.
- **Odor:** Characteristic
- **Molecular Weight** 146 kDa complex (α 1: 65 kDa; β 1: 38 kDa; γ 1: 31 kDa)

(Contd. on page 6)

-US

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/27/2023

Revision date 02/27/2023

Trade name: AMPK Complex (α 1, β 1, and γ 1 subunits; human, recombinant)

(Contd. from page 5)

| | |
|---|--|
| · Odor threshold: | Not determined. |
| · Formulation | 50 mM Sodium phosphate, pH 7.0, with 300 mM sodium chloride, 150 mM imidazole, 0.25 mM DTT, and 25% glycerol |
| · pH-value: | Not applicable. |
| · Change in condition | |
| Melting point/Melting range: | Undetermined. |
| Boiling point/Boiling range: | 100 °C (212 °F) |
| · Flash point: | 199 °C (390.2 °F) |
| · Flammability (solid, gaseous): | Not determined. |
| · Ignition temperature: | 400 °C (752 °F) |
| · 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: | Not determined. |
| · Relative density | Not determined. |
| · Vapor density | Not applicable. |
| · Evaporation rate | Not applicable. |
| · Solubility in / Miscibility with Water: | Soluble. |
| · Partition coefficient (n-octanol/water): | Not determined. |
| · Viscosity: | |
| Dynamic: | Not applicable. |
| Kinematic: | Not applicable. |
| · Solvent content: | |
| Organic solvents: | 25.0 % |
| Water: | 71.3 % |
| VOC content: | 0.00 % |
| Solids content: | 100.0 % |
| · Other information | No further relevant information available. |

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.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.

(Contd. on page 7)

-US-

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/27/2023

Revision date 02/27/2023

Trade name: AMPK Complex (α 1, β 1, and γ 1 subunits; human, recombinant)

(Contd. from page 6)

· **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

· **Information on toxicological effects**

· **Acute toxicity:**

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

ATE (Acute Toxicity Estimate)

| | | |
|------|------|--------------|
| Oral | LD50 | 86,275 mg/kg |
|------|------|--------------|

56-81-5 Glycerol

| | | |
|--------------------|----------------------|---------------------|
| Oral | LD50 | 12,600 mg/kg (rat) |
| Irritation of skin | Irritation | 500 mg/24h (rabbit) |
| Irritation of eyes | Irritation | 500 mg/24h (rabbit) |
| | Intraperitoneal LD50 | 4,420 mg/kg (rat) |
| | Subcutaneous LD50 | 100 mg/kg (rat) |

7647-14-5 Sodium chloride

| | | |
|--------------------|----------------------|--|
| Oral | LDLO | 1,000 mg/kg (man) |
| | TDLO | 650 ml/kg (man) |
| | LD50 | 4,000 mg/kg (mouse) 3,000 mg/kg (rat) |
| Inhalative | LD50 | 4 g/kg (mouse) |
| | LC50 | 320 mg/m ³ (mouse) |
| | TCLO | 0.63 mg/m ³ (hmn) |
| Irritation of skin | LCLO | 29,300 mg/m ³ /7h (mouse) |
| | Irritation | 500 mg/24h (rabbit) |
| | Irritation of eyes | Irritation |
| | Intraperitoneal LD50 | 2,602 mg/kg (mouse) |
| | Subcutaneous LD50 | 31.6 mg/kg (rat) |
| | Intravenous LD50 | 59.5 mg/kg (rat) |
| | Data | 15 mg/3D (hmn) |
| | Subcutaneous LD50 | 3 g/kg (mouse) |

288-32-4 Imidazole

| | | |
|------|------|-------------------|
| Oral | LD50 | 880 mg/kg (mouse) |
|------|------|-------------------|

· **Primary irritant effect:**

· **on the skin:** Irritant to skin and mucous membranes.

· **on the eye:** Irritating effect.

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

· **Additional toxicological information:**

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

Irritant

· **Carcinogenic categories**

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

None of the ingredients is listed.

(Contd. on page 8)

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/27/2023

Revision date 02/27/2023

Trade name: AMPK Complex (α 1, β 1, and γ 1 subunits; human, recombinant)

(Contd. from page 7)

- **NTP (National Toxicology Program)**

None of the ingredients is listed.

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

None of the ingredients is listed.

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.
- **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.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **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

- | | |
|----------------------------------|-------------------------------------|
| · UN-Number | |
| · DOT, IMDG, IATA | UN1759 |
| · UN proper shipping name | |
| · DOT | Corrosive solids, n.o.s. (Glycerol) |
| · IMDG | CORROSIVE SOLID, N.O.S. (Glycerol) |
| · IATA | Corrosive solid, n.o.s. (Glycerol) |

(Contd. on page 9)

-US

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/27/2023

Revision date 02/27/2023

Trade name: AMPK Complex (α 1, β 1, and γ 1 subunits; human, recombinant)

(Contd. from page 8)

· **Transport hazard class(es)**

· **DOT**



· **Class**

8 Corrosive substances

· **Label**

8

· **IMDG, IATA**



· **Class**

8 Corrosive substances

· **Label**

8

· **Packing group**

· **DOT, IMDG, IATA**

III

· **Environmental hazards:**

Not applicable.

· **Special precautions for user**

Warning: Corrosive substances

· **Hazard identification number (Kemler code):** 80

· **EMS Number:**

F-A,S-B

· **Stowage Category**

A

· **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: 25 kg
On cargo aircraft only: 100 kg

· **IMDG**

· **Limited quantities (LQ)**

5 kg

· **Excepted quantities (EQ)**

Code: E1

Maximum net quantity per inner packaging: 30 g

Maximum net quantity per outer packaging: 1000 g

· **IATA**

· **Remarks:**

When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10.

Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.

· **UN "Model Regulation":**

UN 1759 CORROSIVE SOLID, N.O.S. (GLYCEROL), 8, III

-US

(Contd. on page 10)

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/27/2023

Revision date 02/27/2023

Trade name: AMPK Complex (α 1, β 1, and γ 1 subunits; human, recombinant)

(Contd. from page 9)

15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
No further relevant information available.

- **Sara**

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

| | |
|-----------|---------------------|
| 7601-54-9 | trisodium phosphate |
|-----------|---------------------|

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

| | |
|-----------|---------------------|
| 7601-54-9 | trisodium phosphate |
|-----------|---------------------|

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

| | | |
|-----------|---------------------|--------|
| 7732-18-5 | Water | ACTIVE |
| 56-81-5 | Glycerol | ACTIVE |
| 7647-14-5 | Sodium chloride | ACTIVE |
| 288-32-4 | Imidazole | ACTIVE |
| 7601-54-9 | trisodium phosphate | ACTIVE |
| 3483-12-3 | DL-Dithiothreitol | ACTIVE |

- **Hazardous Air Pollutants**

None of the ingredients is 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.

- **Carcinogenic categories**

- **EPA (Environmental Protection Agency)**

None of the ingredients is listed.

- **TLV (Threshold Limit Value)**

None of the ingredients is listed.

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

None of the ingredients is listed.

- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

All chemicals may pose unknown hazards and should be used with caution. This SDS applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this SDS. Cayman Chemical Company assumes no responsibility for incidental or consequential damages, including lost profits, arising from the use of these data. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this SDS is based on technical data judged to be reliable, Cayman Chemical Company assumes no responsibility for the completeness or accuracy of the information contained herein.

(Contd. on page 11)

Safety Data Sheet

acc. to OSHA HCS

Printing date 02/27/2023

Revision date 02/27/2023

Trade name: AMPK Complex (α 1, β 1, and γ 1 subunits; human, recombinant)

(Contd. from page 10)

- **Department issuing SDS:** Environment protection department.
- **Contact:** -
- **Date of preparation / last revision** 02/27/2023
- **Abbreviations and acronyms:**
 - 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)
 - HMIS: Hazardous Materials Identification System (USA)
 - VOC: Volatile Organic Compounds (USA, EU)
 - 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 & Health
 - TLV: Threshold Limit Value
 - PEL: Permissible Exposure Limit
 - REL: Recommended Exposure Limit
 - Skin Irritation 2: Skin corrosion/irritation – Category 2
 - Eye Irritation 2A: Serious eye damage/eye irritation – Category 2A
 - Toxic to Reproduction 1B: Reproductive toxicity – Category 1B
 - Specific Target Organ Toxicity - Repeated Exposure 2: Specific target organ toxicity (repeated exposure) – Category 2

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