MSDS

Version: 1.0

Creation Date: Dec. 6, 2018

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1. Identification

1.1 Product name

APS, Ammonium persulfate

1.2 Other means of identification

Product number	F011615
Other names	diazanium,sulfonatooxy sulfate

1.3 Recommended use of the chemical and restrictions on use

Identified uses	Used for research and development only.Food Additives: FLOUR_TREATMENT_AGENT
Uses advised against	no data available

1.4 Distributor's details

Company	Ecocell Co., Ltd.
Address	F226, 45, Jojeong-daero, Hanam-si, Gyeonggi-do, Korea
Telephone	+82-2-457-2236
Fax	+82-2-6442-2236

1.5 Emergency phone number

Emergency phone number	+82-2-457-2236
Service hours	Monday to Friday, 9am-6pm (Standard time zone: UTC/GMT +9 hours).

2. Hazard identification

2.1 Classification of the substance or mixture

Oxidizing solids, Category 3

Acute toxicity - Oral, Category 4

Skin irritation, Category 2

Eye irritation, Category 2

Skin sensitization, Category 1

Specific target organ toxicity – single exposure, Category 3

Respiratory sensitization, Category 1

2.2 GHS label elements, including precautionary statements

Pictogram(s)

Signal word Danger

Hazard statement(s)

H272 May intensify fire; oxidizer

H302 Harmful if swallowed

H315 Causes skin irritation

H319 Causes serious eye irritation

H317 May cause an allergic skin reaction

H335 May cause respiratory irritation

H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P220 Keep away from clothing and other combustible materials.

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

P264 Wash ... thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P272 Contaminated work clothing should not be allowed out of the workplace.

P271 Use only outdoors or in a well-ventilated area.

P284 [In case of inadequate ventilation] wear respiratory protection.

Response	P370+P378 In case of fire: Use ... to extinguish. P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor/…if you feel unwell. P330 Rinse mouth. P302+P352 IF ON SKIN: Wash with plenty of water/... P321 Specific treatment (see ... on this label). P332+P313 If skin irritation occurs: Get medical advice/attention. P362+P364 Take off contaminated clothing and wash it before reuse. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337+P313 If eye irritation persists: Get medical advice/attention. P333+P313 If skin irritation or rash occurs: Get medical advice/attention. P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P312 Call a POISON CENTER/doctor/…if you feel unwell. P342+P311 If experiencing respiratory symptoms: Call a POISON CENTER/doctor/...
Storage	P403+P233 Store in a well-ventilated place. Keep container tightly closed. P405 Store locked up.
Disposal	P501 Dispose of contents/container to ...

2.3 Other hazards which do not result in classification

no data available

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
Diammonium peroxodisulphate	APS, Ammonium persulfate	7727-54-0	231-786-5	≥98.5%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Medical attention is required. Consult a doctor. Show this safety data sheet (SDS) to the doctor in attendance.

If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

Following skin contact

First rinse with plenty of water for at least 15 minutes, then remove contaminated clothes and rinse again.

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Give one or two glasses of water to drink. Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

Inhalation produces slight toxic effects. Contact with dust irritates eyes and causes skin rash. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

/SRP:/ Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. /Inorganic acids and related compounds/

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

If material involved in fire: Cool all affected containers with flooding quantities of water. Use water in flooding quantities as fog. Apply water from as far a distance as possible. Extinguish fire using agent suitable for type of surrounding fire.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Toxic oxides of nitrogen and sulfuric acid fumes may form in fire. Behavior in Fire: Decomposes with loss of oxygen that increases intensity of fire (USCG, 1999)

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Sweep spilled substance into covered containers. Carefully collect remainder. Then wash away with plenty of water. Do NOT absorb in saw-dust or other combustible absorbents.

6.3 Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

7. Handling and storage

7.1 Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Dry. Well closed. Separated from combustible substances, reducing agents, powdered metals and strong bases.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

Component	APS, Ammonium persulfate			
CAS No.	7727-54-0			
	Limit value - Eight hours		**Limit value - Short term**	
	ppm	**mg/m³**	**ppm**	**mg/m³**
Australia				0,1 (1)
Belgium		0,1		
Ireland		0,1		
Spain		0,1		
United Kingdom		(1)		
	Remarks			
Australia	(1) Ceiling limit value			
Spain	sen			

Component	APS, Ammonium persulfate
CAS No.	7727-54-0
United Kingdom	The UK Advisory Committee on Toxic Substances has expressed concern that, for the OELs shown in parentheses, health may not be adequately protected because of doubts that the limit was not soundly-based. These OELs were included in the published UK 2002 list and its 2003 supplement, but are omitted from the published 2005 list.

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state	Solid.
Colour	-
Odour	Odorless
Melting point/ freezing point	Atm. press.:101.06 kPa.
Boiling point or initial boiling point and boiling range	Atm. press.:100.79 kPa.
Flammability	Not combustible but enhances combustion of other substances. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit / flammability limit	no data available
Flash point	-10°C(lit.)
Auto-ignition temperature	Remarks:No self-ignition up to the max. testing temperature of 600 °C.
Decomposition temperature	120°C
pH	no data available

Kinematic viscosity	no data available
Solubility	Miscible with water
Partition coefficient n-octanol/water	no data available
Vapour pressure	< 0 mm Hg. Temperature:25 °C. Remarks:Estimation: 1.47 E-23 mm Hg => 1.96 E-21 Pa.
Density and/or relative density	1.68 g/cm³. Temperature:20 °C.
Relative vapour density	7.9 (vs air)
Particle characteristics	no data available

10. Stability and reactivity

10.1 Reactivity

The substance is a strong oxidant. It reacts with combustible and reducing materials. Decomposes on heating. This produces toxic and corrosive fumes including ammonia, nitrogen oxides and sulfur oxides. If in solution, reacts violently with iron, powdered aluminium and silver salts. The solution in water is a medium strong acid.

10.2 Chemical stability

no data available

10.3 Possibility of hazardous reactions

Material itself does not burn or burns with difficulty.AMMONIUM PERSULFATE is a potent oxidizing agent. A powdered mixture with aluminum and water can explode [NFPA 491M 1991]. A mixture with sodium peroxide will explode if subjected to friction (crushing in a mortar), heating, or if a stream of carbon dioxide is passed over it [Mellor 10:464 1946-47]. Acidic solutions dissolve iron violently, [Mellor, 1947, Vol. 10, 470].

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

A mixutre of ammonium persulfate and sodium peroxide will explode if subjected to crushing (in a mortar), heating, or if a stream of carbon dioxide is passed over it.

10.6 Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /sulfur oxides, nitrogen oxides and ammonia/.

11. Toxicological information

Acute toxicity

- Oral: LD50 Rat male oral 742 mg/kg
- Inhalation: LC50 Rat inhalation >2950 mg/cu m 4 hr
- Dermal: LD50 - rat (male/female) - > 2 000 mg/kg bw.

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 Toxicity

- Toxicity to fish: LC50 - Oncorhynchus mykiss (previous name: Salmo gairdneri) - 76.3 mg/L - 96 h.
- Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna - 120 mg/L - 48 h.
- Toxicity to algae: EC50 - Phaeodactylum tricornutum - 136 mg/L - 72 h.
- Toxicity to microorganisms: EC50 - Phaeodactylum tricornutum - 136 mg/L - 72 h.

12.2 Persistence and degradability

no data available

12.3 Bioaccumulative potential

no data available

12.4 Mobility in soil

no data available

12.5 Other adverse effects

no data available

13. Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

14. Transport information

14.1 UN Number

ADR/RID: UN1444 IMDG: UN1444 IATA: UN1444

14.2 UN Proper Shipping Name

ADR/RID: AMMONIUM PERSULPHATE
IMDG: AMMONIUM PERSULPHATE
IATA: AMMONIUM PERSULPHATE

14.3 Transport hazard class(es)

ADR/RID: 5.1 IMDG: 5.1 IATA: 5.1

14.4 Packing group, if applicable

ADR/RID: III IMDG: III IATA: III

14.5 Environmental hazards

ADR/RID: no IMDG: no IATA: no

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

no data available

15. Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
Diammonium peroxodisulphate	APS, Ammonium persulfate	7727-54-0	231-786-5
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.

China Catalog of Hazardous chemicals 2015	Listed.
New Zealand Inventory of Chemicals (NZIoC)	Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	Listed.
Vietnam National Chemical Inventory	Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)	Listed.

16. Other information

Information on revision

Creation Date	Feb. 6, 2018
Revision Date	Feb. 6, 2018

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home
- HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
- IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple
- ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg
- Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp
- ECHA - European Chemicals Agency, website: https://echa.europa.eu/
