SAFETY DATA SHEET
Klozur KP

SDS # : 7727-21-1-12EU
Revision date: 2021-02-04
Version 1.03

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Dipotassium peroxodisulfate

Chemical name	Dipotassium peroxodisulfate
Product Name	Klozur KP
Synonyms	Potassium Peroxydisulfate; Dipotassium Peroxydisulfate; Peroxydisulfuric acid, dipotassium salt; Peroxydisulfuric acid, potassium salt
CAS-No	7727-21-1
EC-No	231-781-8
REACH registration number	01-2119495676-19-0001
Formula	K2O8S2 and $K_2 S_2 O_8$

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

Recommended Use:	In situ and ex situ chemical oxidation of contaminants and compounds of concern for environmental remediation applications
Restrictions on Use	Consumer uses: Water treatment chemical, Metal surface treatment products

1.3. Details of the supplier of the safety data sheet

Manufacturer

PeroxyChem LLC
2005 Market Street
Suite 3200
Philadelphia, PA 19103
Phone: +1 267/ 422-2400 (General Information)
E-Mail: sdsinfo-pxc@evonik.com

Responsible Persons

Evonik Operations GmbH
Rellinghauser Str. 1-11
45128 Essen
Germany
Tel: +49 6181 59 4787
E-mail: sds-hu@evonik.com

1.4. Emergency telephone numbers

24-Hour Health Emergency: +49 2365 49 2232

2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Regulation (EC) No 1272/2008

Acute oral toxicity	Category 4, H302
Skin corrosion/irritation	Category 2; H315
Serious eye damage/eye irritation	Category 2; H319
Respiratory sensitization	Category 1; H334
Skin sensitization	Category 1; H317
Specific target organ systemic toxicity (single exposure)	Category 3; H335
Oxidizing Solids	Category 3; H272

For the full text of the H- and EUH- phrases mentioned in this Section, see Section 16.

2.2. Label Elements

Signal word: DANGER

Hazard Statements
H302 - Harmful if swallowed
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H317 - May cause an allergic skin reaction
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335 - May cause respiratory irritation
H272 - May intensify fire; oxidizer

Precautionary statements
P220 - Keep/Store away from clothing/ combustible materials
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
P302 + P352 - IF ON SKIN: Wash with plenty of soap and 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
P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing

Precautionary statements water

2.3. OTHER INFORMATION

General Hazards
Risk of decomposition by heat or by contact with incompatible materials

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance

Dipotassium peroxodisulfate

Chemical name	EC-No	CAS-No	Weight %	Classification according to Regulation (EC) No. 1272/2008 [CLP]	REACH registration number
Potassium Persulfate	231-781-8	7727-21-1	>98	Acute Tox. 4 (H302) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) Resp. Sens. 1 (H334) Skin Sens. 1 (H317) STOT SE 3 (H335) Ox. Sol. 3 (H272)	01-2119495676-19-0001
Potassium Sulfate	231-915-5	7778-80-5	<2		-

For the full text of the H- and EUH- phrases mentioned in this Section, see Section 16

4. FIRST AID MEASURES

4.1. Description of first-aid measures

General Advice Remove from exposure, lie down. Show this material safety data sheet to the doctor in attendance.

Skin Contact Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Get medical attention if irritation develops and persists.

Eye Contact Rinse thoroughly with plenty of water for at least 15 minutes, lifting lower and upper eyelids intermittently. Consult a physician. In case of contact, immediately flush eyes with plenty of water. If symptoms persist, call a physician.

Inhalation Remove from exposure, lie down. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.

Ingestion Do NOT induce vomiting. Call a physician or poison control center immediately. Rinse mouth. Drink 1 or 2 glasses of water.

4.2. Most important symptoms and effects, both acute and delayed

Itching; Redness; Coughing and/ or wheezing

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

Indication of immediate medical attention and special treatment needed, if necessary Treat symptomatically.

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Suitable Extinguishing Media
Water, Cool containers with flooding quantities of water until well after fire is out.

Extinguishing media which shall not be used for safety reasons
Do NOT use water jet.

5.2. Special hazards arising from the substance or mixture

Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases
In case of fire, formation of sulphur oxides, nitrogen oxides, toxic pyrolysis products.

5.3. Advice for firefighters

Special protective equipment for fire-fighters
As in any fire, wear self-contained breathing apparatus and full protective gear.

OTHER INFORMATION
The product is not combustible. Contact with combustible materials may intensify fires. Adjust fire fighting measures to surrounding fire, if possible. Cool endangered containers with water spray and move out of danger area. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Keep off any unprotected persons. Avoid contact with the skin and the eyes. Avoid breathing dust. Wear personal protective equipment.

6.2. Environmental Precautions

See Section 12 for additional Ecological Information.

6.3. Methods and materials for containment and cleaning up

Vacuum, shovel or pump waste into a drum and label contents for disposal. Avoid dust formation. Store in closed container. Clean up spill area and treat as special waste Dispose of waste as indicated in Section 13

Never add other substances or combustible waste to product residues.

6.4. Reference to other sections.

Dispose of waste as indicated in Section 13

7. HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Wear personal protective equipment. Use only in area provided with appropriate exhaust ventilation. Avoid dust formation. Handle product only in closed system or provide appropriate exhaust ventilation at machinery. Avoid contact with skin and eyes. Avoid breathing dust. Remove and wash contaminated clothing before re-use. Reference to other sections.

Additional information
Use clean plastic or stainless steel scoops only

7.2. Conditions for safe storage, including any incompatibilities

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat. Do not store near combustible materials. Avoid contamination of opened product. Keep away from food, drink and animal feedingstuffs. Avoid formation and deposition of dust.

Materials to avoid
Acids, Bases, Halides, Oxidizing agents, Strong reducing agents, Combustible materials,

7.3. Specific end uses

Refer to Section 1 and the Annex.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure Limits Ingredients with workplace control parameters

Chemical name	European Union	The United Kingdom	Ireland
Potassium Persulfate 7727-21-1			TWA 0.1 mg/m ^{3} STEL 0.3 mg/m ^{3} Sensitizer
Chemical name	**France**	**Spain**	**Portugal**
Potassium Persulfate 7727-21-1		TWA 0.1 mg/m ^{3} S+	
Chemical name	**Denmark**	**Finland**	**Norway**
Potassium Persulfate 7727-21-1	TWA 2 mg/m ^{3}		
Chemical name	**Slovakia**	**Switzerland**	**Belgium**
Potassium Persulfate 7727-21-1			TWA 0.1 mg/m ^{3}
Chemical name	**Luxembourg**	**Poland**	**Estonia**
Potassium Persulfate 7727-21-1		TWA 0.1 mg/m ^{3}	
Chemical name	**Latvia**	**Lithuania**	**Czech Republic**
Potassium Sulfate 7778-80-5	TWA 10 mg/m ^{3}	TWA 10 mg/m ^{3}	
Chemical name	**Romania**	**Bulgaria**	**Russia**
Potassium Sulfate 7778-80-5		TWA 10.0 mg/m ^{3}	MAC 10 mg/m ^{3}

Derived No Effect Level (DNEL)

DNELs - General Population				
Potassium Persulfate (7727-21-1)				
Exposure pattern	Route of Exposure	Description	DNEL/DMEL	Most Sensitive Endpoint
Acute - systemic	dermal	LD0	200 mg/kg bw	Acute toxicity
Acute - systemic	Inhalation	LC0	295 mg/m³	Acute toxicity
Acute - systemic	oral	LD0	30 mg/kg bw	Acute toxicity
Acute - local	dermal	LD0	1.124 mg/cm3	Acute toxicity
Acute - local	Inhalation	LC0	295 mg/m³	Acute toxicity
Long term - systemic	dermal	NOAEL	9.1 mg/kg bw/day	repeated dose toxicity
Long term - systemic	Inhalation	NOAEC	1.03 mg/m³	repeated dose toxicity
Long term - systemic	oral	NOAEL	9.1 mg/kg bw/day	repeated dose toxicity
Long term - local	dermal	NOAEL	0.051 mg/cm3	repeated dose toxicity
Long term - local	Inhalation	NOAEC	1.03 mg/m³	repeated dose toxicity

Predicted No Effect Concentration (PNEC)

8.2. Exposure Controls

Engineering measures Provide local exhaust or general ventilation adequate to maintain exposures below permissable exposure limits.

Personal protective equipment

General information Protective engineering solutions should be implemented and in use before personal protective equipment is considered.

Respiratory Protection P2 Dust mask when airborne dust concentrations elevated.

Eye/Face Protection Eye protection recommended. Chemical goggles consistent with EN 166 or equivalent.

Skin and Body Protection Wear suitable protective clothing.

Hand Protection Protective gloves: Neoprene gloves, Polyvinylchloride, Natural Rubber.

Hygiene measures Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Wash hands before breaks and after shifts. Keep work clothes separate, remove

contaminated clothing - launder after open handling of product.

Environmental exposure controls The product should not be allowed to enter drains, water courses or the soil.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance	Crystalline solid
Color	White
Physical State	Solid
Odor	odorless
Odor threshold	Not applicable
pH	6.4 (1% solution)
Flash point	Not flammable
Melting Point/Range	> 100 °C
Freezing Point	Not applicable
Boiling Point/Range	Decomposes Decomposes upon heating
Autoignition temperature	No evidence of combustion up to 600°C
Explosive properties	Not explosive
Vapor pressure	6.07E-30 mm Hg at 25ºC
Vapor density	No information available
Density	2.48 g/cm³ (crystal density)
Relative Density	1.39
Partition coefficient	No information available (inorganic)
Water solubility	5.6 % @ 25 °C
Viscosity	No information available (Solid)
Evaporation Rate	No information available
Decomposition temperature	> 100 °C (assume)

9.2. OTHER INFORMATION

Bulk Density	1.30 g/cm³ (loose)
Molecular weight	270.31

10. STABILITY AND REACTIVITY

10.1. Reactivity

Strong oxidizer

10.2. Chemical Stability

Stable under recommended storage conditions. Unstable if heated. Unstable on exposure to moisture. Unstable in presence of contamination.

10.3. Possibility of Hazardous Reactions

Use of persulfates in chemical reactions requires appropriate precautions and design considerations for pressure and thermal relief.

Decomposing persulfates will evolve large volumes of gas and/or vapor, can accelerate exponentially with heat generation, and create significant and hazardous pressures if contained and not properly controlled or mitigated.

Use with alcohols in the presence of water has been demonstrated to generate conditions that require rigorous adherence to process safety methods and standards to prevent escalation to an uncontrolled reaction.

10.4. Conditions to avoid

Moisture; Heat. (decomposes at temperatures >100 °C).

10.5. incompatible materials

Acids, Bases, Halides, Oxidizing agents, Strong reducing agents, Combustible materials,

10.6. Hazardous Decomposition Products

Incomplete combustion and thermolysis may produce gases of varying toxicity such as carbon monoxide, carbon dioxide, various hydrocarbons, aldehydes and soot.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute toxicity

LD50 Dermal	> 10000 mg/kg (rat) (Potassium Persulfate)
LD50 Oral	1130 mg/kg (rat) (Potassium Persulfate)
LC50 Inhalation	> 42.9 mg/L (rat) (Potassium Persulfate)
Skin Contact	Non-irritating (rabbit). Persulfates in general, specifically diammonium persulfate and dipotassium persulfate, exhibited skin irritation properties in human case reports, following occupational exposure and consumer use.
Eye Contact	Irritating to eyes. Has been shown to exhibit eye irritation properties in human case reports following occupational exposure and consumer use. Slightly or non-irritating (rabbit).
Inhalation	May cause irritation of respiratory tract. Respiratory irritation has been seen in workers exposed to persulfates. In animals, diammonium persulfate, produced pathological respiratory irritation in a subchronic study.
Subchronic toxicity	Oral (NOAEL) = 131.5 mg/kg bw (Potassium Persulfate) Inhalation (NOAEC) = 10.3 mg/m^3 (Ammonium Persulfate) Dermal: No data available
Chronic toxicity	
Sensitization	Sensitizing to skin and respiratory system.
Target organ effects	Eyes. Skin. Respiratory System.
Carcinogenicity	Did not show carcinogenic effects in animal experiments.
Mutagenicity	In vivo tests did not show mutagenic effects.
Reproductive toxicity	Diammonium persulfate did not affect fertility or the developing fetus in animal studies (NOAEL: 250 mg/kg bw).

12. ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxicity effects

Not expected to have significant environmental effects, based on data for similar substances.

Potassium Persulfate (7727-21-1)				
Active Ingredient(s)	Duration	Species	Value	Units
Potassium persulfate	96 h LC50	Onchorhyncus mykiss	76.3	mg/L
Potassium persulfate	48 h EC50	Water flea	120	mg/L
Potassium persulfate	72 h EC50	Marine algae (Phaeodacttylum tricornutum)	136	mg/L
Potassium persulfate	96 h LC50	Turbot (Scophthalmus maximus)	107.6	mg/L
Potassium persulfate	18 h EC10	Pseudonomas putida	36	mg/L

Potassium persulfate	5 d	Abra Alba	11	mg/L
Potassium persulfate	96 h LC50	Grass shrimp	391	mg/L
Potassium persulfate	24 h EC50	Daphnia magna	635.7	mg/L

12.2. Persistence and degradability

Biodegradability does not pertain to inorganic substances.

12.3. Bioaccumulative potential

Does not bioaccumulate.

12.4. Mobility in soil

Dissociates into ions.

12.5. Results of PBT and vPvB assessment

PBT/vPvB assessment is not required for inorganic substances.

12.6. Other Adverse Effects

None known.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Product / Packaging disposal Dispose of as hazardous waste in compliance with local and national regulations.

Contaminated Packaging Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. TRANSPORT INFORMATION

ADR/RID

UN/ID no 1492
Proper Shipping Name Potassium persulfate
Hazard class 5.1
Packing Group III

IMDG/IMO

UN/ID no 1492
Proper Shipping Name Potassium persulfate
Hazard class 5.1
Packing Group III

ICAO/IATA

UN/ID no 1492
Proper Shipping Name Potassium persulfate
Hazard class 5.1
Packing Group III

ADN

UN/ID no	1492
Proper Shipping Name	Potassium persulfate
Hazard class	5.1
Packing Group	III

Transport Symbol

Environmental Hazards This product contains no chemical substance that is listed as a marine pollutant according to DOT

Special Precautions for users According to United Nations "Recommendations on the transport of dangerous goods"

Transport in bulk according to MARPOL 73/78 and the IBC Code See IMDG above

15. REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

International Inventories

Chemical name	TSCA (United States)	DSL (Canada)	EINECS/ELINCS (Europe)	ENCS (Japan)	China (IECSC)	KECL (Korea)	PICCS (Philippines)	AICS (Australia)	NZIoC (New Zealand)
Potassium Persulfate 7727-21-1	X	X	231-781-8	X	X	X	X	X	X
Potassium Sulfate 7778-80-5	X	X	231-915-5	X	X	X	X	X	X

Directive 2008/98/EC on waste
Applicable
Major Accidents (Directive 2012/18/EU)
Included for storage of quantities exceeding 50 Tm
CWC (Chemical Weapons Convention) - Annex on Chemicals
Not applicable

15.2. Chemical Safety Report

A Chemical Safety Assessment has been carried out for this substance.

16. OTHER INFORMATION

Full text of H-phrases referred to in sections 2 and 3
H272 - May intensify fire; oxidizer
H302 - Harmful if swallowed
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H317 - May cause an allergic skin reaction
H335 - May cause respiratory irritation

Restrictions on Use
Consumer uses: Water treatment chemical, Metal surface treatment products.
This product's foreseen or recommended applications are: In situ and ex situ chemical oxidation of contaminants and compounds of concern for environmental remediation applications

Additional information This Safety Data Sheet has been prepared according to Regulation (EC) 1907/2006 and Regulation (EU) 453/2010

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Revision note SDS sections updated: 1

List of Abbreviations and Acronyms

ATE Acute Toxicity Estimate
ADR European Agreement concerning the International Carriage of Dangerous Goods by Road
AND European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
CE50 Concentración Efectiva MediaCEN European Committee for Standardisation
C&L Classification and Labelling
CLP Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
CLV Ceiling Limit Value Par CAS# Chemical Abstracts Service number
CMR Carcinogen, Mutagen, or Reproductive Toxicant
CSA Chemical Safety Assessment
CSR Chemical Safety Report
DNEL Derived No Effect Level
DOT Department of Transportation
DPD Dangerous Preparations Directive 1999/45/EC
DSD Dangerous Substances Directive 67/548/EEC
DU Downstream User
EC European Community
ECHA European Chemicals Agency
EC-Number EINECS and ELINCS Number (see also EINECS and ELINCS)
EEA European Economic Area (EU + Iceland, Liechtenstein and Norway)
EEC European Economic Community
EINECS European Inventory of Existing Commercial Substances
ELINCS European List of notified Chemical Substances
EN European Standard
EQS Environmental Quality Standard
EU European Union
Euphrac European Phrase Catalogue EWC
European Waste Catalogue (replaced by LoW –see below)
FDS Ficha de Datos de Seguridad
GES Generic Exposure Scenario
GHS Globally Harmonized System
IATA International Air Transport Association
ICAO-TI Technical Instructions for the Safe Transport of Dangerous Goods by Air
IMDG International Maritime Dangerous Goods
IMO International Maritime Organization
IMSBC International Maritime Solid Bulk Cargoes
IT Information Technology
IUCLID International Uniform Chemical Information Database
IUPAC International Union for Pure Applied Chemistry
JRC Joint Research Centre
Kow octanol-water partition coefficient
LC50 Lethal Concentration to 50 % of a test population Lethal Dose to 50% of a test population (Median Lethal Dose)
LE Legal Entity
LLV Level Limit Value
LoW List of Wastes (see http://ec.europa.eu/environment/waste/framework/list.htm)
LR Lead RegistrantM/I Manufacturer / Importer MS Member States
MSDS Material Safety Data Sheet
NOEC No observed effect concentration
OC Operational Conditions
OECD Organization for Economic Co-operation and Development
OEL Occupational Exposure Limit
OJ Official Journal
OR Only Representative

OSHA European Agency for Safety and Health at work
PBT Persistent, Bioaccumulative and Toxic substance
PEC Predicted Effect Concentration
PNEC(s) Predicted No Effect Concentration(s)
PPE Personal Protection Equipment
(Q)SAR Qualitative Structure Activity Relationship
RCR Risk Characterization ratio
REACH Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RID Regulations concerning the International Carriage of Dangerous Goods by Rail
RIP REACH Implementation Project
RMM Risk Management Measure
SADT Self-accelerating decomposition temperature
SCBA Self-Contained Breathing Apparatus
SDS Safety data sheet
SIEF Substance Information Exchange Forum
SME Small and Medium sized Enterprises
STEL Short-term exposure limit
STOT Specific Target Organ Toxicity (STOT)
RE Repeated Exposure(STOT)
SE Single Exposure Par SVHC Substances of Very High Concern
TSCA Toxic Substances Control Act
TWA Time Weighed Average
UN United Nations
vPvB Very Persistent and Very Bioaccumulative / mPmB Muy Persistente y Muy Bioacumulativo
WGK Wassergefährdungsklassen

Disclaimer

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Prepared By:

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End of Safety Data Sheet