Regulation concerning the Registration (EG) No. 2020/878 (REACH)

Material Safety Data Sheet

ACO S / ACO BS

SILOXA

Activated Carbon, High density skeleton

Section 1: Product and Company Information

1.1 Product Identifier

Productnames	ACO S, ACO BS	
Additional Identification	EINECS:	931-328-0
	CAS-Number:	7440-44-0
	UFI-Code:	Not applicable
	REACH Registrationnumber:	01-2119488894-16-0036

1.2 Relevant identified uses of substance or mixture and uses adviced against

Production use

Use as an absorbent in industrial, commercial and consumer setting.

Uses adviced against

There are currently no uses advised against known.

1.3 Data Sheet prepared by

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Section 2: Hazards Identification

2.1 Classification of Substance or Composition

No classification according to Regulation (EG) Nr. 1272/2008 (CLP).
No Hazard classification according to Regulation 67/548/EWG or 1999/45/EG.

Additional Information

Not available

Hazard Information for human and environment

Harzard Identification has not been identified.

2.2 Label elements

As the substance is not classified as hazardous, no Hazard label is required.

2.3 Additional Hazard Identification

Since the columnar activated carbon (high skeletal density) is regarded as an inorganic substance, the PBT assessment is not applicable.
Heating, intense heat, ignition sources and contact with strong oxidants such as ozone, liquid oxygen, chlorine, permanganate, etc. may result in fire.
Wet activated carbon uses up oxygen from the air, therefore, dangerously low oxygen concentrations may occur. Before workers enter a container with activated carbon, the oxygen content in the container should always be determined and procedures for potentially low oxygen areas should be followed.
This material can be self-heating under certain conditions (e.g. high humidity). The absorption of moisture promotes self-heating tendency. Do not place Big Bags with activated carbon on a wet surface.
Spent (or used) Activated carbon can exhibit the properties of the adsorbents.

Results of the PBT and vPvB assessment

According to the results of its assessment, this substance is neither a PBT nor a vPvB substance.

Section 3: Composition / Information on Ingredients

3.1 Substance Information

Columnar Activated Carbon, High Density Skeleton
A porous, amorphous adsorbent having a large surface area consisting essentially of elemental carbon, with a high skeletal density.

CAS No: 7440-44-0
EC No: 931-328-0
REACH Registration No: 01-211948884-16-0036

Purity: 85%
Synonym: Not applicable
Stabilisers: Not applicable
Dangerous Additives: Not applicable

Additional Additives

Additives	Typical concentration	Concentration span	Remarks
Calcium oxide; EINECS 215-138-9	ca. 0.8% (w/w)	>= 0.0 – <= 1.0% (w/w)	
Iron oxide; EINECS 215-721-8	ca. 1.0% (w/w)	>= 0.0 – <= 2.0% (w/w)	
Magnesium oxide; EINECS 215-171-9	ca. 1.0% (w/w)	>= 0.0 – <= 2.0% (w/w)	
Potassium carbonate; EINECS 209-529-3	ca. 0.04% (w/w)	>= 0.0 – <= 0.5% (w/w)	
Aluminium oxide; EINECS: 215-691-6	ca. 0.9% (w/w)	>= 0.0 – <= 2.0% (w/w)	mixed oxide may occure
Silicium oxide; EINECS 234-368-0	ca. 4.0% (w/w)	>= 0.0 – <= 10.0% (w/w)	mixed oxide may occure
Sodium hydroxide; EINECS 215-185-5	ca. 0.5% (w/w)	>= 0.0 – <= 0.5% (w/w)	

Section 4: First Aid Measures

4.1 Description of first aid measures

General Information
As not powdered activated carbon has a low dustiness, the risk of accidental exposure in the workplace is low.
The following first aid information is based on contact with activated carbon in powder form.

Inhalation
Remove victim to fresh air. Seek medical attention if breathing is difficult and cough occurs.

Skin Contact / Absorbation
Remove contaminated clothing. Wash affected area with soap and water. Seek medical attention if irritation occurs or persists.

Eye contact
Flush immediately with water. Forcibly hold eyelids apart to ensure complete irrigation of eye tissue
(Remove contact lenses if it may be done easily). Seek medical attention if further irritation occurs.

Ingestion
Flush mouth carefully and drink minimum 0.5L water. Seek medical attention if gastrointestinal symptomes occur.

Self Protection of first aiders
Consider own safety before embarking on a dangerous environment.

4.2 Important acute and delayed symptoms and effects
When ingested large amounts blockages can occur.
Contact with eyes, skin or mucous membranes may cause irritation.

4.3 Indication of immediate medical attention and special treatment
Not applicable

Section 5: Fire Fighting Measures

5.1 Extinguishing media

Suitable extinguishing media
Water, water fog, dry powder or foam.

Unsuitable extinguishing media
None

5.2 Special hazards arising from the substance or mixture

Avoid stirring up dust clouds.
Wet activated carbon can lead to oxygen depletion in confined areas.
Hazardous decomposition products: carbon monoxide. Used activated carbon can lead to other combustion products.
After a fire, smoldering hotspots may be present for a long time within the activated carbon.
Activated carbon, which could smolder for a long time in a confined space, carbon monoxide can accumulate above the lower explosive limit.

5.3 Special Fire Fighting Procedures

Wear personal protective clothing during fire fighting
Wear standard personal protective equipment for firefighters including ambience-air breathing apparatus for all indoor fires and large fires in the open air.

Additional Information for Fire Fighting Procedures
If possible, bring smoldering activated carbon in a safe area (preferably outside).

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

For virginals activated carbon (fresh coal) no personal precautions are required.
For information on personal protection see section 8.

6.2 Environmental precautions

Do not empty into drains or water sources.

6.3 Methods and material for containment and cleaning up

Absorp spillage product and flush remaining product with plenty of water. Avoid dust formation.

6.4 Additional Information

Wet activated carbon uses up oxygen from the air, therefore dangerously low oxygen concentrations may occur.
Before workers enter a container with activated carbon the oxygen content should always be determined in the container and procedures for potentially low oxygen areas should be followed.
Used or spent activated carbon may contain hazardous substances that require that the material is treated in accordance with national laws or local permits and requiring the use of risk management measures when handling the materials.

Section 7: Handling and Storage

7.1 Precautions for safe handling

Precautions
Wear appropriate personal protective equipment (see section 8).

Engineering measures
Measures to avoid dust formation: use of good work practices and technical procedures during discharge.

Action required to protect the environment
Provide containment and proper ventilation.

Specific requirements or handling requirements
Before workers enter a container with activated carbon the oxygen content should always be determined in the container and procedures for potentially low oxygen areas should be followed.

Precautions against fire and explosion
Avoid formation of dust and dust deposits on exposed surfaces. Keep activated carbon away from sources of ignition.

Additional Information
Wet activated carbon uses up oxygen from the air, therefore dangerously low oxygen concentrations may occur.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures and storage conditions
Do not store at high temperatures or in direct sunlight.

Packaging materials
Store in the original packaging.

Advice on common storage
Keep away from strong oxidizing agents (e.g. ozone, liquid oxygen, chlorine, permanganate, etc.) and strong acids.
Keep away from heat sources.

Requirements for storage areas and containers
Set in a cool, well-ventilated area away from contamination sources. Not place Big Bags with activated carbon on a wet surface.

Storage class
Not applicable

Further information about storage conditions
The quantity of stored wet activated carbon should be limited. In enclosed storage containing wet activated carbon - oxygen alarms are recommended.

7.3 Specific End Uses
Not applicable

Section 8: Personal Protection and Exposure Controls

8.1 Control parameters

Control parameters for workplace or biological

Occupational Exposure Limits

Limited Air values

Limit value-Type (Country of origin)	Substance name	Occupational exposure limits		Recommended monitoring procedures	Top limits	Source
		long term (mg/m³)	Short term			
Germany	Activated carbon alveolare fraction	1.5	–	Personal air sampling for the alveolar fraction	–	DFG, German Research Foundation: MAK and BAT Values 2010 list, Senate committee to examine health-damaging agents, Note 46; VCH
	Activated carbon respirable fraction	4	–	Personal air sampling for the respirable fraction	–	

Biological Limits

There is no biological limit value is established.

Additional exposure limit values for the operating conditions

None

DNEL/DMEL and PNEC values

DNEL/DMEL		Exposure route	Exposure frequency	Critical component	Remark
Worker	Consumer				
3 mg/m³	0.5 mg/m³	Inhalation	short term (acute) long term (repeated)	Activated Carbon	The provisional inhalation DNEL long-term exposure for local effects is based on the OEL (TWA, 8 hrs.) Established by the American Conference of Governmental Industrial Hygienists (ACGIH, 2001) for inhalable dust soot. The OEL is to minimize excessive pollution and effects on lung function

There was no PNEC derived since the substance is highly soluble and contain no data available on ecotoxicity.

8.2 Limitation and monitoring of exposure

Control of exposure in the workplace
- A good basic standard of occupational hygiene has to be applied to any use of activated carbon outside of a container.

Security checks
- Working method for low oxygen content should be available - Wet activated carbon consumes oxygen from the air, therefore dangerously low oxygen concentrations may occur. Before workers enter a container with activated carbon, the oxygen content in the container should always be determined and Procedures for potentially low oxygen areas should be followed. Alternatively, the room can be equipped with oxygen sensors with an alarm setting at 18 vol.%.

Technical measures to prevent exposure
- No technical measures to prevent exposure are required for industrial and commercial use of granular activated carbon and granular activated carbon slurries.
- For industrial use powdered activated carbons, which are kept in high retention with only occasional possibility of exposure, no technical measures are needed.
- For commercial use powdered activated carbons, which are kept in high retention with up to no possibility of exposure, no technical measures are needed.
- Local Provide exhaust ventilation with a minimum efficiency of 90% for all activities.

Personal protective equipment
- When dealing with non-powdered activated carbon or slurried no personal protective equipment is required.
- Respiratory protection: For dealing with activated carbon in powder form (high skeletal density) use a half face mask with P2 filter (minimum efficiency of 90%). Reduce dust levels to a minimum.
- Hand protection: None uses requiring a hand guard were specifically identified, but the use of gloves is recommended as a good work practice.
- Eye protection: Wear safety glasses with side if contact with activated carbon may occur in powder form.
- Body protection: Standard protective clothing.

8.3 Environmental protection measures

Product related measures to prevent exposure
- To remove the material at the source, provide local ventilation
- Storage in Container
- Regulated Waste

Training to prevent exposure
- Integration of ISO 14001
- Appropriate documentation such as work instruction method

Organisational measures to prevent exposure
- Educational work in the workforce
- Regular procedural review
- Environmental audits carried out by certified personnel

Technical measures to prevent exposure
Not applicable

8.4 Control of consumer exposure
Normal use of activated carbon (high skeletal density) sold as filter-products for Households is safe under all foreseeable conditions.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance
Form: Solid
Color: Black
Exhalation: Inodorous

Important health, safety and environmental
Safety relevant basic data

Endpoint	Value	Method	Remark
pH (20 °C)	9–11		
Melting point / range (°C)	> 1,000		The melting point of activated carbon (high skeletal density) is estimated in an inert environment to well over 1,000 °C.
Boiling point / range (°C)	> 1,000		The boiling point of activated carbon (high skeletal density) is estimated in an inert environment to well over 1,000 °C.
Flash point (°C)	–		
Ignition temperature (°C)	350–450		
Vapour pressure (°C)	–		
Skeleton density (g/cm³)	2.10–2.20		
Bulk density (kg/m³)	450–500		
Water solubility (20 °C in g/L)	0		The water solubility of carbon (high skeletal density) was determined according to OECD Guideline 105 GLP with the columnelutionsmethod. It has been found that the substance at pH 6.8 and a temperature of 20 °C is insoluble in water.
Distribution coefficient n-Octanol / Water (log P_{ow})	–		The water solubility of activated carbon (high skeletal density) was determined according to OECD Guideline 105 GLP with the column-elutionsmethod. It has been found that the substance at pH 6.8 and a temperature of 20 °C is insoluble in water.
Viscosity, dynamic (mPa·s)	–		The Substance is a solid.
Explosion ranges for Danger of explosion: - lower - upper	–		

9.2 Additional information

The physical and chemical properties of the used material can be different to those of the virgin activated carbon (fresh coal).

Section 10: Stability and Reactivity

10.1 Reactivity

This product shows no reactivity under the specified conditions of storage, transport and use.

10.2 Chemical Stability

This product is stable under the stated conditions for storage, transport and use.

10.3 Possibility of hazardous reactions

Contact with strong oxiders, such as Chlorine, liquid oxygen, permanganate, ozone can lead to rapid combustion / explosion possible.

10.4 Conditions to avoid

Keep operating temperatures below 70 °C. Do not store in direct sunlight.

10.5 Incompatible materials

Keep away from strong oxidisers and strong acids.

10.6 Hazardous decomposition products

Carbon monoxide or carbon dioxide.

Section 11: Toxicological Information

11.1 Toxicokinetics, metabolism and distribution

Based on the physical and chemical properties of activated carbons, the lack of effects in toxicological studies and the therapeutic use of activated carbon as an adsorbent for the treatment of acute poisoning and acute diarrhea, it can be expected that activated carbon (high skeletal density) by the oral and dermal routes is not absorbed as well as by inhalation.

Toxicological data for humans

This information is not available and it is not a standard requirement under REACH.

11.2 Acute Effects (toxicity tests)

	Effect dose	Species	Method	Remark
Acute oral toxicity	LD50: > 2,000 mg/kg bw (female) (No treatment-related effects were observed.)	Rat, female	OECD-Guideline 423 (acute oral toxicity - method acute toxic class) EU Method B.1 tris (acute oral toxizcity - method acute toxic class)	reliably, without limitation
Acute dermal toxicity	Not available	–	–	In accordance with column 2 of REACH Annex VII: it needs no acute toxicity study on dermal routes (required in Section 8.5) to be conducted, as studies on acute oral and inhalation toxicity are available.
Acute inhalation toxicity	LC0 (1 hour): 64.4 mg/L air (nominal) or 8.5 mg/L air (analytical) (male/female) (No deaths, but several effects were observed (contamination of the skin, general stress, pulmonary rales, weight loss, lung discoloration)) LC100 (1 hour): 235 mg/L Air (nominal) (All animals died (ITT))	Rat	equivalent or similar to OECD Guideline 403 (acute inhalation toxicity)	reliably, with limitation

Specific target organ toxicity, (STOT)

No information available on individual organ toxicities.

Specific symptoms in animal studies

After swallowing: Not applicable
After skin contact: Not applicable
After inhalation: Weight loss, irritation of the respiratory mucosa and - at necropsy - lung discoloration was observed. The LC50 for the inhalation route was determined as > 8.5 mg / L.
After eye contact: Not applicable

Irritant / Corrosive effects

	Exposure time	Species	Evaluation	Method	Remark
Primary irritation to the skin	4 hours	Rabbit	Not-irritating	OECD-guideline 404	reliably, with limitation
Irritation to the eye		Rabbit	Not-irritating	OECD-guideline 405 (Acute eye irritation /-corrosion) (2002) EU Method B.5 (Acute Toxicity: Acute eye irritation /-corrosion) (2008)	reliably, without limitation

Respiratory irritation
Not available

Sensitization
In case of skin contact: Non-sensitizing
In case of inhalation: No data available

Repeated dose toxicity (sub-acute, sub-chronic, chronic)

	Effectiv dose	Value	Exposure time	Species	Method	Evaluation	Remark
Chronic inhalation		no NOAEC identified	7 hrs. / day for 5 days / week for 1 year	Rat Guinea pig Mouse	no standardized method		Study not reliable

CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)

Effects	Value
Carcinogenicity	Not availalabe
In- vitro mutagenicity	Not availalabe
Genotoxicity	Not availalabe
in-vivo mutagenicity	Not availalabe
Germ cell mutagenicity	Negativ with and without metabolic activation
Reproductive toxicity	Not availalabe

Summary evaluation of the CMR properties
All 3 in-vitro-key studies that the substance has no genotoxic potential. It can therefore be concluded that the substance is not mutagenic and therefore for mutagenicity in accordance with the criteria in Annex I of Regulation 1272/2008 / EC (CLP / GHS EU) and Annex VI to Directive 67/548 / EEC does not need to be classified.
It has been shown in three in-vitro genotoxicity studies that the substance is not genotoxic properties (not mutagen cat. 3) and in a supportive chronic toxicity study in three species were no systemic effects (hyperplasia and / or pre-neoplastic lesions) shown.

11.3 Practical experience
Observations relevant to classification: Not applicable
Other observations: Not applicable

11.4 General remarks
None

Section 12: Ecological Information

12.1 Toxicity
No data available. Since activated carbon is highly insoluble in water, no toxicity is expected.

12.2 Persistence and degradability
Activated carbon (high skeletal density) is a solid inorganic material and not accessible to degradation by natural chemical or enzymatic processes.
Activated carbon (high skeletal density) is degraded only under extreme conditions - such as under reflux with mixtures of concentrated sulfuric acid / nitric acid heat - when the carbon finally oxidized to CO_2. Activated carbon (high skeletal density) can not be converted into a soluble, absorptive form. Therefore, activated carbon (high skeletal density) finds its way to any cell location where it could conceivably be biodegraded. In addition, testing the biodegradability is not feasible because the substance is insoluble in water.
The bioaccumulation study was resigned, as the substance has no log Kow (the substance is an inorganic substance or behaves as an inorganic substance and so can be seen as one). In addition, the substance size will impede passing the membranes, since the substance consists of particles with sizes> 0.5 microns. The particles are not soluble in water.

12.3 Bioaccumulation potencial
The substance has a low potential to bioaccumulate in aquatic species (eg fish) ie a BCF <10th.

12.4 Mobility in soil

Known or predicted distribution to environmental
–

Surface tension
No information available since the material is insoluble.

Adsorption / desorption
Adsorptions-/desorptionsstudys are not technically feasible because the substance in water or organic solvents is not soluble; and an analysis is not possible, since there is no distinction between C of the activated carbon (high skeletal density) and C of the sediment / soil in the analysis can be made. Furthermore, activated carbon (high skeletal density) largely of elemental carbon and is chemically inert. There will be no further biodegradation.

12.5 Results of PBT- und vPvB-assessment
Since activated carbon (high skeletal density) is considered inorganic substance is a PBT assessment not applicable.

12.6 Endocrine disrupting properties
Not applicable

12.7 Other adverse effects
A water slurry, which contains large amounts of activated carbon (high skeletal density), may have high pH values.

Section 13: Disposal Considerations

13.1 Waste treatment methods
For virgin activated carbon (fresh coal) no specified disposal methods apply. Do not empty into drains.

13.2 Waste codes / waste designations according to EWC / AVV
Waste key: EWC 15.02.03

13.3 Suitable packaging
Not applicable

13.4 Further Information
Spent activated carbon may require special Disposal / packaging.

Section 14: Transport Information

ADR/RID	The product is not dangerous under transport regulations for packaging units with a volume at most of 3 m^3 (3 m^3, at most)
AND	The product is not dangerous under transport regulations for packaging units with a volume at most of 3 m^3 (3 m^3, at most)
IMDG/IMO	The product is not dangerous under transport regulations for packaging units with a volume at most of 3 m^3 (3 m^3, at most)
ICOA/IATA	The product is not dangerous under transport regulations for packaging units with a volume at most of 3 m^3 (3 m^3, at most)

Environmental hazards
For transporting not classified as dangerous for the enviroment.

Special precautions for user
Wet activated carbon uses up oxygen from the air, therefore dangerously low oxygen concentrations may occur. Whenever workers enter a container with activated carbon, before the oxygen content should be determined in the container and Procedures for potentially low oxygen areas should be followed. Big Bags do not place with charcoal on a wet surface.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

14.1 UN number or ID number
ADR / RID / ADN, IMDG, IATA Not applicable

14.2 UN proper shipping name
ADR / RID / ADN, IMDG, IATA Not applicable

14.3 Transport hazard classes
ADR / RID / ADN, IMDG, IATA Not applicable

14.4 Packing group
ADR / RID / ADN, IMDG, IATA Not applicable

14.5 Environmental hazards
ADR / RID / ADN, IMDG, IATA Not applicable

14.6 Special precautions for user
Not applicable

14.7 Transport in bulk by sea according to IMO instruments
Not applicable
- Transport / additional information: No dangerous goods according to the above regulations
- UN 'Model Regulation': Not applicable

Section 15: Regulatory Information

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

EU regulations

- Approvals and / or restrictions on use
- Approvals: None
- Restrictions on use: None
- Other EU regulations: –

National regulations

Not applicable

15.2 Chemical safety assessment

A chemical safety assessment has been carried out according to the rules laid down in the REACH regulation.
The appendices contain an overview of the risk management measures based on that assessment.

Section 16: Other Information

The information is based on our current state of knowledge, but does not constitute a guarantee of product properties and does not establish a contractual legal relationship. This safety data sheet complies with Regulation (EC) No 1272/2008 [CLP], Article 31 as amended by Regulation (EU) 2020/878.

16.1 Changes in this version

Rev. 1.6; new creation: 2024-09-10
Inclusion of information on the UFI code.
Adaptation of the ingredients.
Adaptation of the form to the ECHA Guidance version 4.0/12/20.

16.2 Abbreviations and acronyms

ADR	Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
AwSV	Ordinance on Installations for the Handling of Substances Hazardous to Water
AVV	Waste Catalogue Ordinance
CAS	Chemical Abstracts Service
CLP	Classification, Labelling and Packaging of substances and mixtures
DNEL	Derived No Effect Level
d	Day(s)
EAKV	European Waste Catalogue according to the draft Waste Catalogue Ordinance
EINECS	European INventory of Existing Commercial chemical Substances
ELINCS	European LIst of Notified Chemical Substances
ECHA	European Chemicals Agency
EWC	European Waste Catalogue
IARC	INTERNATIONAL AGENCY FOR RESEARCH ON CANCER
IMDG	International Maritime Code for Dangerous Goods
IATA	International Air Transport Association
IATA-DGR	Dangerous Goods Regulations by the 'International Air Transport Association' (IATA)
ICAO	International Civil Aviation Organisation
ICAO-TI	Technical Instructions by the 'International Civil Aviation Organisation' (ICAO)
GHS	Globally Harmonised System of Classification and Labelling of Chemicals
GefStoffV	Ordi
LOAEL	Lowest observed adverse effect level
LOAEC	Lowest observed adverse effect concentration
LC50	Lethal concentration, 50 percent
LD50	Lethal dose, 50 percent
NOAEL	No observed adverse effect level
NOAEC	No observed adverse effect concentration
NLP	No-Longer Polymers
N/A	Not applicable

OECD	Organisation for Economic Co-operation and Development
PNEC	Predicted no effect concentration
PBT	Persistent bioaccumulative toxic
	(Regulations Concerning the International Transport of Dangerous Goods by Rail)
REACH	Registration, Evaluation, Authorisation of Chemicals
SVHC	Substance of very high concern
TRGS	Technical rules for hazardous substances
UN/NU	United Nations (Vereinte Nationen)
VOC	Volatile Organic Compounds
VwVwS	Administrative regulation on substances hazardous to water
WGK	Water hazard class

16.3 Important literature and data sources

Regulation (EC) No 1272/2008 [CLP]
Regulation (EU) 2020/878
ECHA Guidance version 4.0/12.20

Training instructions
Basic training on the hazards of the substance and the use of risk management measures is required.

Recommended restrictions on use
Avoid contact with strong oxidizing agents (and strong acids).

16.4 Use and exposure categories (overview)

Classification	Classification procedure
Resp. Sens. 1; H334	Calculation experience
Skin Sens. 1; H317	Calculation experience
Muta. 2; H341	Calculation experience
Carc. 1A; H350i	Calculation experience
Repr. 1B; H360D	Calculation experience
STOT RE 1; H372	Calculation experience
Aquatic Chronic 2; H411	Calculation experience

Exposition	Industrial use	Professional use	Consumer use
Human, orally, short term	0	0	0
Human, orally, long term / repeated	0	0	0
Human, dermal, short term	+	+	+
Human, dermal, long term / repeated	+	+	+
Human, inhalation, short term	+	+	+
Human, inhalation, long term / repeated	+	+	+
Environment, water, short term / single	+	+	+
Environment, water, continuously	+	+	+
Environment, air, short term/single	+	+	+
Environment, air, continuously	+	+	+
Environment, soil, short term / single	+	+	+
Environment, soil, continuously	+	+	+

Use adviced (+)
Use not recommended (–)
Use not identified (0)

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