

Sodium carbonate



[Identification](#) | [Characterisation](#) | [Formula](#) | [Physical and chemical properties](#) |
[Toxicology / Ecotoxicology](#) | [Occupational health and first aid](#) | [Safe handling](#) | [Regulations](#) | [Links](#) |
[Literature register](#)

IDENTIFICATION

Sodium carbonate

Soda ash

Anhydrous soda

ZVG No: 490211

CAS No: 497-19-8

EC No: 207-838-8

INDEX No: 011-005-00-2

anhydrous

Related

CAS No: 5968-11-6

6132-02-1

24551-51-7

monohydrate

decahydrate

hydrate in general

CHARACTERISATION

SUBSTANCE GROUP CODE

122200 Sodium compounds

125200 Carbonates, hydrogen carbonates

STATE OF AGGREGATION

The substance is solid.

PROPERTIES

powder

white

odourless

CHEMICAL CHARACTERISATION

Non-combustible substance.

Freely soluble in water.

Hygroscopic.

Aqueous solution reacts strongly alkaline.

Acute or chronic health hazards result from the substance.
(see: chapter REGULATIONS).

[Substance information in Wikipedia](#)

DUST EXPLOSIVENESS

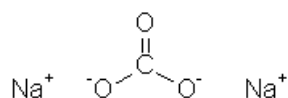
No risk of dust explosion.

Quelle: 99999

FORMULA

Na_2CO_3

CNa_2O_3



Molar mass: 105,99 g/mol

PHYSICAL AND CHEMICAL PROPERTIES

[Melting point](#) | [Density](#) | [Solubility](#) | [pH-value](#) |
[Hazardous reactions](#)

MELTING POINT

Melting point: 851 °C

Begins to lose CO_2 even at 400 °C.

Reference: 00132

DENSITY

DENSITY

Value: 2,53 g/cm³

anhydrous

Reference: 00132

DENSITY

Value: 2,25 g/cm³

monohydrate

Reference: 00132

DENSITY

Value: 1,46 g/cm³

decahydrate

Reference: 00132

SOLUBILITY IN WATER

Concentration: 217 g/l

Temperature: 20 °C

Reference: [00220](#)

pH-VALUE

pH-value: 12

Temperature: 25 °C

Concentration: 106 g/l

Reference: [01211](#)

HAZARDOUS REACTIONS

Thermal decomposition

Decahydrate loses water of crystallization at 34 deg C.

Monohydrate loses water of crystallization at 100 deg C.

Decompositon products

sodium oxide

Hazardous chemical reactions

Risk of explosion in contact with:
calcium (powder)
2,4-dinitrotoluene
trichloroethene/acid

The substance can react dangerously with:
aluminium
fluorine
lithium
acids
water
vegetable oil (rare)
phosphorus pentoxide (heat)
light metals --> formation of hydrogen

TOXICOLOGY / ECOTOXICOLOGY

TOXICOLOGICAL DATA

LD50 oral rat

Value: 4090 mg/kg

Unknown

Reference: [02071](#)

ECOTOXICOLOGICAL DATA

LC50 Fish (96 hours)

Minimum: 300 mg/l

Maximum: 300 mg/l

Median: 300 mg/l

Study number: 3

Reference for median:

Cairns, J.Jr., and A. Scheier 1959. The Relationship of Bluegill Sunfish Body Size to Tolerance for Some Common Chemicals. Proc.13th Ind.Waste Conf., Purdue Univ.Eng.Bull 96:243-252

LC50 Crustaceans (48 hours)

Minimum: 176 mg/l
Maximum: 1640 mg/l
Median: 565 mg/l
Study number: 5

Reference for median:

Dowden, B.F., and H.J. Bennett 1965. Toxicity of Selected Chemicals to Certain Animals. J.Water Pollut.Control Fed. 37(9):1308-1316

EC50 Crustaceans (48 hours)

Minimum: 200 mg/l
Maximum: 200 mg/l
Median: 200 mg/l
Study number: 1

Reference for median:

Warne, M.S.J., and A.D. Schifko 1999. Toxicity of Laundry Detergent Components to a Freshwater Cladoceran and Their Contribution to Detergent Toxicity. Ecotoxicol.Environ.Saf. 44(2):196-206

Reference: [02072](#)

OCCUPATIONAL HEALTH AND FIRST AID

[Routes of exposure](#) | [Toxic effects](#) |
[First Aid](#)

ROUTES OF EXPOSURE**Main routes of exposure**

Intake of sodium carbonate (Na_2CO_3) in the workplace is expected to be mainly via the respiratory tract and the gastrointestinal tract.
Oral intake in food needs also to be taken into consideration. [435]

Respiratory tract

Na_2CO_3 could be inhaled as dust or as an aerosol from a solution. [419]
Dust from the commercial product "Light soda" is considered to have a particle diameter of about 90 - 150 μm with about 250 - 500 μm for "Dense soda". Dust from light soda reaches the upper respiratory tract where it is mainly deposited because of the particle size. Hardly any of the light soda reaches the lower respiratory tract. Particles deposited in the upper respiratory tract are subjected to mucociliary clearance and at least in part are transported into the gastrointestinal tract. Dense soda is hardly able to reach the respiratory tract because of its particle size and hygroscopic properties. [435]

Skin

Skin contact with Na_2CO_3 can occur in the workplace (during its production and use) and also outside the workplace (when using various consumer products such as washing powder containing soda). [435]
Significant absorption via the skin is not expected. [419]

Gastrointestinal tract

Exposure to dust is expected in part to result in transport into the gastrointestinal tract (as a result of mucociliary clearance in the respiratory tract or direct swallowing). [99999]

In the stomach, Na_2CO_3 is neutralized by the gastric acid. In view of the high intake of sodium salts with normal food, no toxicological significance is attributed to the absorption of Na_2CO_3 in the gastrointestinal tract. [435]

TOXIC EFFECTS

Main toxic effects

Acute:

Irritation to the eyes and mucous membranes [435]

Chronic:

Damage to the mucous membranes in the nose, [435] damage to the skin [419]

Acute toxicity

Handling of Na_2CO_3 is only expected to cause local irritation and damage resulting from its hygroscopic properties and alkali reactions by its solutions (a 5% solution has a pH of 11.5 - 11.6). [419]

The potential of the dry salt, its hydrate and in part also solutions to cause irritation has been the subject of numerous tests.

The results of valid tests on irritation to rabbits' eyes differ. Irritation through to strong irritation was found in tests with the application of 0.1 ml of Na_2CO_3 monohydrate or with the dry salt. By contrast, only weak irritation resulted following the instillation of 0.1 g of Na_2CO_3 into the conjunctival sac, not requiring a classification as irritating to the eye. The overall assessment was that Na_2CO_3 is considered to be irritating to the eye. [435]

Information on skin irritation caused in the workplace is available from a report on massive exposure. Immersing of the hands for 4 to 8 h into a hot detergent solution containing soda led to reddening of the skin and in part also to the formation of blisters. [454]

Irritation to the skin was examined on volunteers by applying 0.2 g of moistened 98% Na_2CO_3 for up to 4 hours in a patch test and by applying a 50% aqueous solution (contact with intact and with abraded skin). Reddening and swelling was seen but only on pre-damaged skin. No effects were seen on the intact skin. Animal tests revealed irritation on pre-damaged skin and are therefore consistent with these results. No significant potential to irritate the skin was therefore concluded. [419, 435]

No indication of any potential to sensitize the skin could be found. [99983]

Patch tests using a 10% solution on workers engaged in the mining and processing of soda provided negative results.

Systemic effects are not even expected following intensive contact with the skin. [419] Rabbits showed lethargy and rapid respiration following 24 hour occlusive contact with 2000 mg/kg bw of a concentrated solution (1 g/ml) on 30% of their body surface, but there were no deaths.

Tests on the inhalative toxicity were carried out with an respirable aerosol. The aerosol contained 91% or 95% Na_2CO_3 at a concentration of 500 - 4600 mg/m³ (aerodynamic particle diameter: 1 µm; aerosol was prepared by burning sodium). Rats, mice and guinea pigs were exposed to the aerosol for 2 hours. The animals showed symptoms caused by irritation (dyspnoea, wheezing, excessive salivation, distention of the abdomen). Deaths occurred either during the exposure or within 1 - 10 days. The autopsy of the animals which died immediately showed damage in the posterior pharynx and larynx (accumulation of mucus, vesiculation, mucosal edema). There were also lesions in the anterior trachea, hemorrhage in the lungs and severe gastric tympany. A 2h LC50 was determined at 800 mg/m³ for guinea pigs, 1200 mg/m³ for mice and 2300 mg/m³ for rats. [435]

During occupational exposure to dusts, the main effects expected are irritation in the nose and throat (coughing, sneezing, respiratory complaints). [419] The particle diameter of product dust usually encountered has been shown to be significantly larger than that for the aerosols tested in the experiments (see under "Respiratory tract"), so the danger resulting from inhalative exposure should be low. [99999]

No cases of poisoning caused by swallowing Na_2CO_3 have been reported despite its use for a long time now as an additive to food and as a washing powder. Irritation to the mucous membranes and gastrointestinal disturbances would be expected. [435,454]

The oral toxicity was low in animal experiments. LD50 values determined on rats were mostly in the range 4000 to > 5000 mg/kg bw. [220] The lowest LD50 on rats was 2800 mg/kg bw using a 20% solution of Na_2CO_3 monohydrate. [435]

Chronic toxicity

Repeated contact with the skin was stated to be able to cause dermatitis (reddening, drying and scaling of the skin), resulting from the hygroscopic properties of Na₂CO₃ [419]

Detailed data or reports on experience are not available. [99983]

Information apparently derived from workplaces indicates that long-term exposure to Na₂CO₃ can cause increased discharge of mucus in the nose and airways but the effect is reversible once the exposure ceases. Information from earlier reports from workplaces indicates that damage to the mucus membranes in the nose was also seen. Of 156 workers with fairly continuous exposure, there were 14 perforations, 5 impending perforations and 10 cases of atrophy of the nasal mucosa, but without any complaints. The exposure was described as high (but without any further details). [419] During the relevant exposure the contamination must have been extreme. [99999]

An experimental study was carried out on rats using a 2% aqueous Na₂CO₃ aerosol with a particle size of < 5 µm. The animals inhaled the aerosol 4 h/d, 5 d/w for 3.5 months at a concentration of 70 mg/m³. The exposure led to damage to the bronchial epithelium (hyperplasia, desquamation, perivascular edema). The upper airways (which could have been more severely damaged) were not investigated. [435]

Because the aerosol contained only fine, respirable particles which do not correspond to exposure to commercial soda dust (see under "Respiratory tract"), these results only have limited application in estimating the dangers in the workplace. [99999]

Further long-term animal experimental studies are not available. [99983]

A systemic effect which would certainly be expected to result from excessive intake of sodium by humans is an impact on the regulation of the blood pressure. The recommended daily consumption of sodium from a nutritional-physiologic viewpoint is 2 - 3 g although a normal diet mostly leads to an intake of 3 - 6 g.

Additional intake of sodium resulting from exposure to Na₂CO₃ in the workplace should hardly be of any significance compared to this. Na₂CO₃ is permitted to be used without any limitations as an additive to food. [435]

Reproductive toxicity, mutagenicity, carcinogenicity

Reproductive toxicity:

There are no indications that Na₂CO₃ has any damaging effect on development or on the capability to reproduction. [419]

Taking the kinetic and physiological processes in the body to which these ions are subjected into consideration, such effects would also not be expected.

No developmental toxicological effects were found when high oral doses of Na₂CO₃ were administered during pregnancy in studies on mice, rats and rabbits, thereby confirming the above assumptions. [435]

Mutagenicity:

There is no indication that Na₂CO₃ has any mutagenic effect. [419]

A test on bacteria had a negative result. [435]

Carcinogenicity:

There is no indication of any potential for Na₂CO₃ to cause cancer. [419]

Biotransformation and excretion

Following intake of Na₂CO₃, both sodium and carbonate ions are subjected to physiological metabolic processes.

Sodium ions are present in the body in high concentrations as mineral substances and electrolytes where they are extensively bound into physiological processes. [99983] They are excreted mainly with the urine but also with the sweat and the feces. Because of their physiological significance, their excretion via the kidneys is subject to a homeostatic mechanism which includes re-absorption processes in various functional units of the kidneys. The regulation of blood pressure is particularly closely associated with the excretion of sodium ions. [454]

Carbonate ions dissociate in the aqueous phase and form an equilibrium with hydrogencarbonate ions which can be excreted via the urine and with CO₂ which can be exhaled. The equilibrium of this dissociation is the most important extracellular buffer system in the blood and in the interstitial liquids, by means of which the pH is regulated. This control system comprises the increased exhalation of CO₂ during acidosis caused by hyperventilation or otherwise the reduced elimination of bicarbonate ions by means of increased re-absorption in the kidneys. [435]

Annotation

This occupational health information was compiled on 10.11.2011.

It will be updated if necessary.

FIRST AID

Eyes

Rinse the affected eye with widely spread lids for 10 minutes under running water whilst protecting the unimpaired eye.

Arrange medical treatment.

[419]

Skin

Remove contaminated clothing while protecting yourself.

Rinse the affected skin areas for at least 10 to 20 minutes under running water.

Arrange for medical treatment.

[419]

Respiratory tract

Whenever irritation or complaints appear:

Whilst protecting yourself remove the casualty from the hazardous area and take him to the fresh air.

Arrange medical treatment.

[419]

Swallowing

If large amounts of the salt or concentrated solutions have been swallowed:

Rinse the mouth and spit the fluids out.

If the casualty is conscious have him drink 1 glass of water (ca 200 ml).

During spontaneous vomiting hold the head of the casualty low with the body in a prone position in order to avoid aspiration.

Arrange medical treatment.

[2001, 99999]

Information for physicians

Sodium carbonate (soda) is tolerated systemically in high doses. The main effects are expected to be local irritation. [435, 419]

- Symptoms of acute poisoning:

Eyes: burning, reddening, pain, irritation to the conjunctiva, possibly slight damage to the cornea (dependent on modifications to the salt, concentration)

Skin: in general no irritation to the intact skin; [435] if the skin has been pre-damaged or under certain conditions (e.g. contact with hot solutions, mixed with detergents) possibly reddening, swelling, formation of blisters [435, 454]

Inhalation: inhalation of dust normally only causes irritation of the upper airways (coughing, dry throat, sneezing, slightly impeded respiration) [419, 2001] following massive exposure to fine dust (not normally encountered) possibly formation of edema/tissue damage in the larynx, throat, bronchi [435]

Ingestion: irritation (burning) in the mouth, esophagus, stomach, gastrointestinal disturbances (abdominal pain, nausea) [454, 2001]

Absorption: uptake of overdoses of sodium resulting from exposure to sodium carbonate is considered unlikely, [435] if this happens, symptoms would be expected to be metabolic disturbances with increased blood pressure, functional disturbances to the kidneys and resulting effects to the heart-circulatory and nerve systems. [454]

- Medical advice:

Following impact in the eye, thorough rinsing followed by treatment by an ophthalmologist. [419]

Following skin contact, thorough rinsing is normally sufficient. [435] Irritated areas can be treated in the usual way. [99999]

If massive amounts of dust are inhaled, take the casualty into the fresh air and observe him. Treat symptomatically as necessary. [2001]

Inhalation of water vapor could be helpful to treat irritation in the nose/throat, reduce the salt concentration on mucous membranes and help remove the salt more quickly. [99999]

If there are complaints following the swallowing of large doses of the salt, the casualty should immediately be examined in hospital. An endoscopy is indicated. [454]

At least short-term observation should take place, particularly for the heart-circulatory system (check of blood pressure), kidney function, electrolyte balance and blood parameters. [454, 419]

Recommendations

Provide the physician information about the substance/product and treatment already administered.

Sodium carbonate is available with various modifications and with slightly different properties. It is a component in many consumer products. [435]
Some accident reports concern washing powders containing soda, which were swallowed or inhaled by little children, necessitating immediate transport to hospital and an immediate endoscopy (no report on any resulting damage). [454]

Annotation

This first aid information was compiled on 10.11.2011.
It will be updated if necessary.

SAFE HANDLING

[Handling](#) | [Storage](#) | [Fire and explosion protection](#) | [Organisational measures](#) | [Personal protection](#) | [Disposal considerations](#) | [Accidental release measures](#) | [Fire fighting measures](#)

TECHNICAL MEASURES - HANDLING

Workplace

Select ventilation measures according to the other used substances.

If there is a chance that dusts may be released, then the work room must provide adequate ventilation.

Washing facility at the workplace required.

Eye bath required. These locations must be signposted clearly.

Equipment

Use closed apparatus if possible.

If release of the substance cannot be prevented, then it should be suctioned off at the point of exit.

Consider emission limit values, a purification of waste gases if necessary.

Label containers and pipelines clearly.

Unsuitable materials:

Aluminium

Zinc

light metal

Advice on safer handling

Take care to keep workplace clean and dry.

Do not leave container open.

Sufficient ventilation must be guaranteed for refilling, transfer, or open use.

Avoid spillage.

Fill only into labelled container.

Avoid rising dust.

Cleaning and maintenance

Use protective equipment while cleaning if necessary.

Avoid dust formation. Dust formation that cannot be avoided must be collected regularly.

Use a tested industrial vacuum cleaner or suction device.

Do not raise dust while cleaning.

Use of a blower for cleaning is not permitted.

Alternative: clean damp.

TECHNICAL MEASURES - STORAGE

Storage

Do not use any food containers - risk of mistake.
Containers have to be labelled clearly and permanently.
Store in the original container as much as possible.
Keep container tightly closed.
Recommended storage at room temperature.
Store in a dry place.
Substance is hygroscopic, protect from moisture.

Conditions of collocated storage

Storage class 10 - 13 (Other liquids and solids)

Only substances of the same storage class should be stored together.

Collocated storage with the following substances is prohibited:

- Pharmaceuticals, foods, and animal feeds including additives.
- Infectious, radioactive und explosive substances.
- Strongly oxidizing substances of storage class 5.1A.

Under certain conditions the collocated storage with the following sub-stances is permitted (For more details see [TRGS 510](#)):

- Gases.
- Flammable liquids of storage class 3.
- Other explosive substances of storage class 4.1A.
- Pyrophoric substances.
- Substances liberating flammable gases in contact with water.
- Oxidizing substances of storage class 5.1B.
- Ammonium nitrate and preparations containing ammonium nitrate.
- Organic peroxides and self reactive substances.
- Combustible and non combustible acutely toxic substances of storage classes 6.1A and 6.1B.

The substance should not be stored with substances with which hazardous chemical reactions are possible.

TECHNICAL MEASURES - FIRE AND EXPLOSION PROTECTION

Technical, constructive measures

Substance is non-combustible. Select fire and explosion prevention measures according to the other used substances.

ORGANISATIONAL MEASURES

Instruction on the hazards and the protective measures using instruction manual ([TRGS 555](#)) are required with signature if just more than one minor hazard was detected.

Instruction must be provided before employment and then at a minimum of once per annum thereafter.

Observe the restrictions on juvenile employment as defined in the "Jugendarbeitsschutzgesetz".

PERSONAL PROTECTION

Body protection

Wear an apron or a lab coat.

Respiratory protection

In an emergency (e.g.: unintentional release of the substance) respiratory protection must be worn. Consider the maximum period for wear.

Respiratory protection: Particle filter P2, colour code white.

Use insulating device for concentrations above the usage limits for filter devices, for oxygen concentrations below 17% volume, or in circumstances which are unclear.

Eye protection

Sufficient eye protection must be worn.

Wear glasses with side protection.

Hand protection

The use of resistant protective gloves is recommended.

Skin protection cremes do not protect as effectively against the substance as protective gloves. Therefore suitable protective gloves should be preferred as far as possible.

The following information is valid for aqueous, saturated solutions of the salt.

The following materials are suitable for protective gloves (Permeation time \geq 8 hours):

Natural rubber/Natural latex - NR (0,5 mm) (use non-powdered and allergen free products)

Polychloroprene - CR (0,5 mm)

Nitrile rubber/Nitrile latex - NBR (0,35 mm)

Butyl rubber - Butyl (0,5 mm)

Fluoro carbon rubber - FKM (0,4 mm)

Polyvinyl chloride - PVC (0,5 mm)

The times listed are suggested by measurements taken at 22 °C and constant contact. Temperatures raised by warmed substances, body heat, etc. and a weakening of the effective layer thickness caused by expansion can lead to a significantly shorter breakthrough time. In case of doubt contact the gloves' manufacturer. A 1.5-times increase / decrease in the layer thickness doubles / halves the breakthrough time. This data only applies to the pure substance. Transferred to mixtures of substances, these figures should only be taken as an aid to orientation.

Occupational hygiene

Take heed of usual occupational hygiene measures when handling chemical substances, especially wash the skin with soap and water before breaks and at the end of work and apply fatty skin-care products after washing.

Avoid contact with eyes. In case of contact rinse the affected eye(s).

DISPOSAL CONSIDERATIONS

Hazardous waste according to Waste Catalogue Ordinance (AVV).

If there is no way of recycling it must be disposed of in compliance with the respective national and local regulations.

Collection of small amounts of substance:

Collect in container for inorganic solids.

Neutral solutions (pH-control):

Place in a collection container for salt solutions, adjust for a pH value of 6-8.

Collection vessels must be clearly labelled with a systematic description of their contents. Store the vessels in a well-ventilated location. Entrust them to the appropriate authorities for disposal.

ACCIDENTAL RELEASE MEASURES

Wear personal protective equipment (see chapter Personal Protection).

Pick up without creating dust.

Afterwards ventilate area and wash spill site.

Endangerment of watert:

Low hazard to waters. Inform the responsible authorities when very large quantities get into water, drainage, sewer, or the ground.

FIRE FIGHTING MEASURES**Instructions**

Substance is incombustible. Select fire fighting measures according to the surrounding conditions.

REGULATIONS

EUROPEAN GHS CLASSIFICATION AND LABELLING

Classification

Eye irritation, Category 2; H319



Signal Word "Warning"

Hazard Statement - H-phrases

H319: Causes serious eye irritation.

Precautionary Statement - P-phrases

P264: Wash thoroughly after handling.

P280: Wear eye protection/face protection.

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.

Manufacturer's specification by Merck

Reference: [01211](#)

State: 2020

Checked: 2021

The substance is listed in appendix VI, table 3 of CLP regulation.

The given classification can deviate from the listed classification, since this classification is to be complemented concerning missing or divergent danger classes and categories for the respective substance.

Reference: [99999](#)

GHS-CLASSIFICATION OF MIXTURES

The classification of mixtures containing this substance results from Annex 1 of Regulation (EC) 1272/2008.

Reference: [99999](#)

WORKPLACE LABELLING ACCORDING TO GERMAN [ASR A1.3](#)

Precept label



Use safety goggles

GERMAN WATER HAZARD CLASS

Substance No: 222

WGK 1 - low hazard to waters

Classification according to the announcement of the list of substances hazardous to water in the Federal Register of 10.08.2017, last update 24.11.2023

TECHNICAL INSTRUCTIONS ON AIR QUALITY CONTROL (TA LUFT)

Chapter 5.2.1 Overall Dust, including fine dust

The emissions of dust in the exhaust gas are not allowed to exceed the following values:

Mass flow: 0,20 kg/hr

or

Mass conc.: 20 mg/m³

The mass per unit volume of 0,15 g/m³ in exhaust gas is not allowed to be exceeded also on observance or lower deviation of a mass flow of 0,20 kg/h.

TRANSPORT REGULATIONS

Not subject to transport regulations.

Reference: [01211](#)

RESTRICTIONS OF USE / BANS OF USE

REACH Regulation (EC) No 1907/2006 Annex XVII

Annex XVII, Point 75

Mixtures containing certain hazardous substances shall no longer be placed on the market for tattooing purposes. Mixtures containing such substances in specified concentrations shall no longer be used for tattooing purposes after 04.01.2022. Substances falling within one or more of the following points:

- carcinogenic or reproductive toxic substances according to Part 3 of Annex VI to CLP Regulation (excluding the classification due to effects only following exposure by inhalation),
- skin-sensitising, skin-corrosive, skin-irritant, serious eye-damaging or eye-irritant substances according to Annex VI Part 3 of the CLP Regulation,
- substances listed with specified conditions in Annex II or IV to Regulation (EC) No 1223/2009 [Cosmetics Regulation], and
- substances listed in Appendix 13 to Annex XVII (point 75) of the REACH Regulation.

In general, mixtures placed on the market for use for tattooing purposes must be labelled "Mixture for use in tattoos or permanent make-up." from 04.01.2022 on and may not be used for tattooing purposes without this labelling. Further safety information shall be provided on the packaging or in the instructions for use. Before using a mixture for tattooing purposes, the person using the mixture shall provide this information to the person undergoing the procedure.

Further information on the restrictions, concentration limits and exemptions can be taken from the Regulation.

Annex XVII to Regulation (EC) No 1907/2006, [consolidated version](#) (BAUA) (only in German)

TECHNICAL RULES FOR HAZARDOUS SUBSTANCES

[TRGS 201](#)

Einstufung und Kennzeichnung bei Tätigkeiten mit Gefahrstoffen; Ausgabe Februar 2017, zuletzt geändert und ergänzt April 2018

[TRGS 400](#)

Gefährdungsbeurteilung für Tätigkeiten mit Gefahrstoffen; Ausgabe Juli 2017

[TRGS 555](#)

Betriebsanweisung und Information der Beschäftigten; Ausgabe Februar 2017

[TRGS 600](#)

Substitution; Ausgabe Juli 2020

[TRGS 500](#)

Schutzmaßnahmen; Ausgabe September 2019

[TRGS 509](#)

Lagern von flüssigen und festen Gefahrstoffen in ortsfesten Behältern sowie Füll- und Entleerstellen für ortsbewegliche Behälter; Ausgabe Juni 2022

[TRGS 510](#)

Lagerung von Gefahrstoffen in ortsbeweglichen Behältern; Ausgabe Januar Dezember 2020

REGULATIONS OF GERMAN ACCIDENT INSURERS

[DGUV Regel 112-190](#)

Benutzung von Atemschutzgeräten, Ausgabe November 2021
(in German only)

LINKS

[OECD Screening Information DataSet \(SIDS\)](#)

[DGUV Information 213-098: List of substances - lesson in schools \(in German only\)](#)

REFERENCES

Quelle: 00001

IFA: Erfassungs- und Pflegehandbuch der GESTIS-Stoffdatenbank (nicht öffentlich)
Data acquisition and maintenance manual of the GESTIS substance database (non-public)

Quelle: 00131

The Merck-Index; 14th Edition 2006

Quelle: 00132

The Merck-Index; 15th Edition 2013

Quelle: 00220

IUCLID-CD-ROM, Year 2000 edition; European Commission, Joint Research Centre, Institute for Health and Consumer Protection, European Chemicals Bureau; Ispra, Italy

Quelle: 00419

CHEMINFO - Chemical Profiles Created by CCOHS

Quelle: 00435

Organisation for Economic Cooperation and Development (OECD) "Screening Information Data Set for High Production Volume Chemicals (SIDS)", <http://www.inchem.org/pages/sids.html>

Quelle: 00454

Hazardous Substances Data Bank (HSDB)

Quelle: 01211

GHS-Sicherheitsdatenblatt, Merck
GHS Material Safety Data Sheet, Merck

Quelle: 02001

International Chemical Safety Cards (ICSC)

Quelle: 02071

Toxicological Data, compiled by the National Institute of Health (NIH), USA, selected and distributed by Technical Database Services (TDS), New York, 2009

Quelle: 02072

Ecotoxicological Data, compiled by the US Environmental Protection Agency (EPA), selected and distributed by Technical Database Services (TDS), New York, 2009

Quelle: 05174

Kühn-Birett-Merkblätter: 174. Ergänzungslieferung; 06/2004

Quelle: 05300

[TRGS 510](#) "Lagerung von Gefahrstoffen in ortsbeweglichen Behältern" Ausgabe Dezember 2020

Quelle: 06002

L. Roth, U. Weller

"Gefährliche Chemische Reaktionen" Loseblattsammlung mit Ergänzungslieferungen, ecomed-Verlag
("Dangerous chemical reactions" loose-leaf collection with supplement deliveries)

Quelle: 07580

Bekanntmachung der Liste der wassergefährdenden Stoffe im Bundesanzeiger vom 10.08.2017,
zuletzt geändert 24.11.2023

Quelle: 07635

AUERDATA 98

Quelle: 07795

H. Geerßen "GloSaDa 2000 Plus - Glove Safety Data"

Quelle: 99983

Liste arbeitsmedizinisch-toxikologischer Standardwerke (2)

List of standard references regarding occupational health and toxicology (2)

Quelle: 99999

Angabe des Bearbeiters

Indication of the editor

[Identification](#) | [Characterisation](#) | [Formula](#) | [Physical and chemical properties](#) |
[Toxicology / Ecotoxicology](#) | [Occupational health and first aid](#) | [Safe handling](#) | [Regulations](#) | [Links](#) |
[Literature register](#)

This material data sheet was carefully compiled. However no liability can be assumed for the data content, whatever the legal cause may be.