

# Safety in the Laboratory

**Batch number** K12345630

**Hazard symbols**

**Minimum shelf-life** 31.08.04

**Catalogue number** 1.00030.2500

**Safety and transport data** 2.51

**Risk and safety phrases**

**UN 1648**

**Transport number**

**Chemical Name:** LICHROXOL® Acetonitril

**Manufacturer:** Merck KGaA, 60271 Darmstadt, Germany

## In Emergencies

- Stay calm
- Make emergency call
- Without placing yourself at risk, rescue victims from the area of immediate danger
- Position injured persons appropriately and comfort them
- Prevent any further damage

## Emergency phone numbers

**Emergency Medical Service:**

**Poison Information Centre:**

**Fire brigade:**

## Important details:

- Who is calling from where?
- What has happened?
- Where did it happen?
- How many people are injured/affected?
- When did it happen?

## Hazard Symbols

**E: Explosive**

**T: Very toxic**

**O: Oxidizing**

**C: Corrosive**

**F: Highly flammable**

**F: Extremely flammable**

**Xn: Harmful**

**Xi: Irritant**

**N: Dangerous for the environment**

**T: Toxic**

## General Precautions

Hazardous substances may only be kept at the workplace in quantities that are just sufficient to ensure continuity of work.

Laboratories are to observe the National "Guidelines for Laboratories". Our reagents are intended exclusively for use in the laboratory.

We therefore assume that users, through their technical training and professional experience, are familiar with the precautions that they need to observe when handling the chemicals.

Since, as a rule, only small quantities are handled in the laboratory, any risk to health can generally be ruled out by close observance of the advice printed on the label.

Anyone handling chemicals should always observe the following safety rules, whether the label carries a hazard warning or not.

## Safety Rules

- Always wear eye protection; wear protective gloves wherever possible.
- Carry out as much work as possible in an efficient fume cupboard or at least in a well-ventilated area, wearing respiratory equipment as required.
- Avoid all contact with skin, eyes and mucosal tissue.
- Immediately rinse splashes from the skin using plenty of cold water; use polyethylene glycol to rinse off lipophilic substances.
- Corrosive substances entering the eye should be thoroughly rinsed out with a gentle jet of water (e.g. eye shower).
- Hold the eyelids wide open and move the eyes in all directions. Consult an eye specialist immediately, stating the chemical substance involved.
- Immediately remove any clothing that has become contaminated with dangerous materials.
- Be sure to seek medical advice in the event of an accident or if you feel unwell.
- Do not eat, drink or smoke in the laboratory
- Observe the rules of the Safety Data Sheets and SOP's.

## For further safety precautions and advice for pregnant women

See national guidelines and publications. In Germany e.g. publication M039 "Safety at Work", issued by BG Chemie, 69021 Heidelberg, Germany.

## Storage Classes

Each product is assigned to a storage class (LGK) according to its hazard properties. The definition of storage classes conforms with the concept of combined storage of chemicals laid down by the VCI (German Chemical Industrial Federation). This system is based on the laws, regulations and technical rules of Germany.

LGK	Definition	LGK	Definition
1	Explosive Materials (2nd German Explosives Act; Storage groups 1.1-1.4)	5.1B	Oxidizing agents (German TRGS 515 group 2+3)
2A	Compressed, liquified or pressure-dissolved gases	5.1C	Oxidizing agents (German TRGS 511 group A-C)
2B	Pressurized gas packages (aerosols containers)	5.2	Organic peroxides
3A	Flammable liquid materials (Flip below 55 °C)	6.1A	Flammable toxic materials
3B	Flammable liquids (German VbF Hazard Class: A)	6.1B	Non-flammable toxic materials
4.1A	Flammable solid materials (2nd German Explosives Act; Storage groups I-III)	7	Radioactive materials
4.1B	Flammable solid materials (EC Method A 10)	8	Corrosive materials
4.2	Self-heating materials	8A	Flammable corrosive materials
4.3	Materials which form flammable gases in contact with water.	8A	Non-flammable corrosive materials
5.1A	Oxidizing agents (German TRGS 515 group 1)	9	n.n.
		10	Flammable liquids (if not LGK 3A or 3B)
		11	Flammable solids
		12	Non-flammable liquids in non-flammable packages
		13	Non-flammable solids in non-flammable packages

## Risk and Safety Phrases

- Risk phrases (R)**
- R 1 Explosive when dry.
  - R 2 Risk of explosion by shock, friction, fire or other sources of ignition.
  - R 3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
  - R 4 May cause very sensitive explosive metallic compounds.
  - R 5 Heating may cause an explosion.
  - R 6 Explosive with or without contact with water.
  - R 7 Highly flammable.
  - R 8 Extremely flammable.
  - R 9 Explosive when mixed with combustible material.
  - R 10 Flammable.
  - R 11 Highly flammable.
  - R 12 Extremely flammable.
  - R 13 Reacts violently with water.
  - R 14 Contact with water liberates extremely flammable gases.
  - R 15 Explosive when mixed with oxidizing substances.
  - R 16 Spontaneously flammable in air.
  - R 17 In use, may form flammable/explosive vapour-air mixture.
  - R 18 May form explosive peroxides.
  - R 20 Harmful by inhalation.
  - R 21 Harmful in contact with skin.
  - R 22 Harmful if swallowed.
  - R 23 Toxic by inhalation.
  - R 24 Toxic in contact with skin.
  - R 25 Toxic if swallowed.
  - R 26 Very toxic by inhalation.
  - R 27 Very toxic in contact with skin.
  - R 28 Very toxic if swallowed.
  - R 29 Contact with water liberates toxic gas.
  - R 30 Can become highly flammable in air.
  - R 31 Contact with acids liberates toxic gas.
  - R 32 Contact with acids liberates very toxic gas.
  - R 33 Danger of cumulative effects.
  - R 34 Causes burns.
  - R 35 Causes severe burns.
  - R 36 Irritating to eyes.
  - R 37 Irritating to respiratory system.
  - R 38 Irritating to skin.
  - R 39 Danger of very serious irreversible effects.
  - R 40 Limited evidence of a carcinogenic effect.
  - R 41 Risk of serious damage to eyes.
  - R 42 May cause sensitization by inhalation.
  - R 43 May cause sensitization by skin contact.
  - R 44 Risk of explosion if heated under confinement.
  - R 45 May cause cancer.
  - R 46 May cause heritable genetic damage.
  - R 47 Danger of serious damage to health by prolonged exposure.
  - R 48 May cause cancer by inhalation.
  - R 49 May cause cancer by ingestion.
  - R 50 Very toxic to aquatic organisms.
  - R 51 Toxic to aquatic organisms.
  - R 52 Harmful to aquatic organisms.
  - R 53 May cause long-term adverse effects in the aquatic environment.
  - R 54 Toxic to flora.
  - R 55 Toxic to fauna.
  - R 56 Toxic to soil organisms.
  - R 57 Toxic to bees.
  - R 58 May cause long-term adverse effects in the environment.
  - R 59 Dangerous for the ozone layer.
  - R 60 May impair fertility.
  - R 61 May cause harm to the unborn child.
  - R 62 Possible risk of impaired fertility.
  - R 63 Possible risk of harm to the unborn child.

- R 64 May cause harm to breastfed babies.
  - R 65 Harmful; may cause long damage if swallowed.
  - R 66 Repeated exposure may cause skin dryness or cracking.
  - R 67 Vapours may cause drowsiness and dizziness.
  - R 68 Possible risks of irreversible effects.
- Combination of risk phrases (R)**
- R 14/15 Reacts violently with water, liberating extremely flammable gases.
  - R 14/22 Harmful; danger of serious damage to health by prolonged exposure through inhalation and in contact with skin.
  - R 20/21 Harmful by inhalation and in contact with skin.
  - R 20/22 Harmful by inhalation and if swallowed.
  - R 21/22 Harmful in contact with skin and if swallowed.
  - R 23/24 Toxic by inhalation and in contact with skin.
  - R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
  - R 23/25 Toxic by inhalation and if swallowed.
  - R 24/25 Toxic in contact with skin and if swallowed.
  - R 26/27 Very toxic by inhalation and in contact with skin.
  - R 26/27/28 Very toxic by inhalation, in contact with skin and if swallowed.
  - R 26/28 Very toxic by inhalation and if swallowed.
  - R 27/28 Very toxic in contact with skin and if swallowed.
  - R 36/37 Irritating to eyes and respiratory system.
  - R 36/37/38 Irritating to eyes and skin.
  - R 37/38 Irritating to respiratory system and skin.
  - R 36/37/38 Irritating to eyes, respiratory system and skin.
  - R 39/23/24/25 Toxic; danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
  - R 39/23/25 Toxic; danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
  - R 39/23/26 Toxic; danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
  - R 39/24/25 Toxic; danger of very serious irreversible effects in contact with skin and if swallowed.
  - R 39/24/26 Toxic; danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
  - R 39/24/27 Very toxic; danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
  - R 39/25/26 Toxic; danger of very serious irreversible effects if swallowed.
  - R 39/26/27 Very toxic; danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
  - R 39/26/27/28 Very toxic; danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
  - R 39/26/28 Very toxic; danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
  - R 39/27/28 Very toxic; danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed.
  - R 42/43 May cause sensitization by inhalation and skin contact.
  - R 48/20/21 Harmful; danger of serious damage to health by prolonged exposure through inhalation and in contact with skin.
- Safety phrases (S)**
- S 1 Kept locked up.
  - S 2 Keep out of reach of children.
  - S 3 Keep in a cool place.
  - S 4 Keep away from living quarters.
  - S 5 Keep contents under ... (to be specified by the manufacturer).
  - S 6 Keep contents under paraffin oil.
  - S 7 Keep under ... (to be specified by the manufacturer).
  - S 8 Keep contents under nitrogen.
  - S 9 Keep under carbon dioxide.
  - S 10 Keep container tightly closed.
  - S 11 Keep container in a well-ventilated place.
  - S 12 Do not keep the container sealed.
  - S 13 Keep away from heat, drink and animal feeding stuffs.
  - S 14 Keep away from ... (to be specified by the manufacturer).
  - S 15 Keep away from reducing agents, heavy-metal compounds, acids and alkalis.
  - S 16 Keep away from oxidizing and acidic substances as well as heavy-metal compounds.
  - S 17 Keep away from iron.
  - S 18 Keep away from water and alkalis.
  - S 19 Keep away from acids.
  - S 20 Keep away from metals.
  - S 21 Keep away from oxidizing and acidic substances.
  - S 22 Do not breathe dust.
  - S 23 Do not breathe vapour/spray.
  - S 24 Do not breathe gas.
  - S 25 Do not breathe vapour.
  - S 26 Do not breathe fumes.
  - S 27 Avoid contact with skin.
  - S 28 Avoid contact with eyes.
  - S 29 Avoid contact with clothing.
  - S 30 Avoid contact with water.
  - S 31 Avoid contact with ... (to be specified by the manufacturer).
  - S 32 Avoid contact with ... (to be specified by the manufacturer).
  - S 33 Avoid contact with ... (to be specified by the manufacturer).
  - S 34 Avoid contact with ... (to be specified by the manufacturer).
  - S 35 Avoid contact with ... (to be specified by the manufacturer).
  - S 36 Avoid contact with ... (to be specified by the manufacturer).
  - S 37 Avoid contact with ... (to be specified by the manufacturer).
  - S 38 Avoid contact with ... (to be specified by the manufacturer).
  - S 39 Avoid contact with ... (to be specified by the manufacturer).
  - S 40 Avoid contact with ... (to be specified by the manufacturer).
  - S 41 In case of fire and/or explosion do not breathe fumes.
  - S 42 During fumigation/spraying wear suitable respiratory equipment.
  - S 43 In case of fire, use ... (never use water) (to be specified by the manufacturer).
  - S 43.1 In case of fire, use water.
  - S 43.2 In case of fire, use water or powder extinguisher.
  - S 43.3 In case of fire, use powder extinguisher. Never use water.
  - S 43.4 In case of fire, use carbon dioxide. Never use water.
  - S 43.6 In case of fire, use sand. Never use water.
  - S 43.7 In case of fire, use metal-free fire extinguisher. Never use water.
  - S 43.8 In case of fire, use sand, carbon dioxide or powder extinguisher. Never use water.
  - S 43.11 In case of fire, use ... (to be specified by the manufacturer).
  - S 43.12 In case of fire, use ... (to be specified by the manufacturer).
  - S 43.13 In case of fire, use ... (to be specified by the manufacturer).
  - S 43.14 In case of fire, use ... (to be specified by the manufacturer).
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  - S 43.97 In case of fire, use ... (to be specified by the manufacturer).
  - S 43.98 In case of fire, use ... (to be specified by the manufacturer).
  - S 43.99 In case of fire, use ... (to be specified by the manufacturer).
  - S 44.00 In case of fire, use ... (to be specified by the manufacturer).

## Dangerous Chemicals

Chemical Name	Risk Phrases	Safety Phrases	Chemical Name	Risk Phrases	Safety Phrases	Chemical Name	Risk Phrases	Safety Phrases
Acetaldehyde	R 12-36/37-40	S 16-33-36/37	Boron trichloride	R 14-26/28-34	S 26-36/37/39-45	Cresoles	R 24/25-34	S 36/37/39-45
Acetic acid 100%	R 10-35	S 23-26-45	Boron trifluoride	R 14-26-35	S 26-36/37/39-45	Crotonaldehyde	R 11-24/25-34	S 36/37/39-45
Acetic anhydride	R 10-20/22-34	S 26-36/37/39-45	Bromine	R 14-26-35	S 26-36/37/39-45	Cumene hydroperoxide	R 2-2-2-2-2-2	S 2-2-2-2-2-2
Acetone	R 11-36-66-67	S 2-23-26-45	Bromoacetic acid	R 23/24/25-35	S 26-36/37/39-45	Cyclohexane	R 11-38-50/53-65	S 16-33-61-62
Acetonitrile	R 11-20/21/22-23	S 11-36-36/37	Bromomethane (Methyl bromide)	R 23/24/25-35	S 26-36/37/39-45	D		
Acetyl chloride	R 11-14-34	S 9-16-26-45	Bromoform	R 23/24/25-35	S 26-36/37/39-45	1,2-Dibromoethane	R 45-62/63-68	S 36/37/39-45
Acrolein	R 11-24/25-36/37-38-50	S 36/37/39-45-61	Bromomethane (Methyl bromide)	R 23/24/25-35	S 26-36/37/39-45	Dibromomethane	R 20-52/53	S 24-61
Acrylamide	R 6-48/50-53-68/60-62/64/2	S 53-45	Butane	R 12	S 9-16	1,2-Dichlorobenzene	R 22-36/37/38-50/53	S 23-26-61
Acrylic acid	R 10-20/21/22-23-50	S 26-36/37/39-45-61	1-Butene	R 12	S 9-16	Dichlorodimethylsilane	R 11-38/37/38	S 53-45
Acrylonitrile	R 11-24/25-36/37-38-50	S 53-45-61	Butylamine	R 11-20/21/22-23	S 3-16-26-29-36/37/39-45	1,2-Dichloroethane	R 45-11-22-36/37/38	S 53-45
Allyl alcohol	R 10-23/24-50	S 36/37/39-45-61	Butyronitrile	R 23-36/37/38-50	S 45	Dichloroacetic acid sodium salt	R 22-31-36/37-50/53	S 26-36/37/39-45
Allylamine	R 11-23/24/25-51/53	S 16-24/25-45-61	Cadmium chloride	R 6-48-60-61-62-68/69/72/90/3	S 53-45	Dichloromethane (Methylene chloride)	R 40	S 23-24/25-36/37
Aluminum chloride (anhydrous)	R 34	S 7/8-28-1.45	Carbon disulfide	R 11-38/38-49/23-62-63	S 16-33-36/37-45	N,N-Diethylaniline	R 23/24/25-33-51/53	S 53-45
4-Aminophenol	R 20/22-50/53-68	S 28-1-36/37-60-61	Carbon monoxide	R 61-12-E23-E48/23	S 53-45	Diethyl ether	R 11-19-66/67	S 9-16-29-33
Ammonia (anhydrous)	R 34-50	S 9-16-26-36/37/39-45-61	Carbon tetrachloride	R 23/24/25-40/23-53/53-59	S 23-26-36/37-45-59-61	Diethyl sulfide	R 45-16-29/33	S 53-45
Ammonium	R 45-60-61-62-E21-E25	S 53-45-60-61	Chloral hydrate	R 25-36/38	S 25-45	Diisopropyl ether	R 11-19-66/67	S 9-16-29-33
Ammonium fluoride	R 23/24/25	S 26-45	Chloramine T	R 22-31-34-42	S 22-26-36/37/39-45	N,N-Dimethylacetamide	R 61-E20/21	S 53-45
Aniline	R 20/21-22-34-50	S 53-45-61	Chlorine	R 23-36/37/38-50	S 9-45-61	Dimethylamine	R 10-20/22-34	S 3-16-26-29-36/37/39-45
o-Anisidine	R 45-E23/24/25-68	S 53-45-61	Chloroacetic acid	R 25-34-50	S 23-27-45-61	N,N-Dimethylformamide	R 23/24/25-33-50/53	S 53-45
Antimony(III) chloride	R 34-51/53	S 26-45-61	Chloroacetone	R 23/24/25-51/53	S 45-61	Dimethyl carbonate	R 11	S 9-16-33
Antimony(III) fluoride	R 23/24/25-51/53	S 7-26-45-61	Chloroacetyl chloride	R 14-23/24/25-35-48/23-50	S 7/8-9-26-36/37/39-45-61	Dimethyl ether	R 11-E20/21-36	S 53-45
Arsenic	R 23/25	S 20/21-28-1.45	3-Chloroaniline	R 23/24/25-33-50/53	S 26-36/37-45-60-61	N,N-Dimethylformamide	R 11-E20/21-36	S 53-45
trans-Azobenzene	R 45-E20/22-E48/22-68-60/53	S 53-45-60-61	Chlorobenzene	R 10-20-51/53	S 24/25-61	Hydrogen bromide (anhydrous)	R 23-35	S 9-26-36/37/39-45
Azobenzene	R 20/22	S 28	1-Chloro-2,4-dichlorobenzene	R 23/24/25-33-50/53	S 28-1-37-45-60-61	Hydrogen peroxide (30% H <sub>2</sub> O <sub>2</sub> )	R 2-2-2-2-2-2	S 2-2-2-2-2-2
Benzaldehyde	R 8-20/22	S 13-27	Chloroethane	R 45-12	S 28-1-37-45-60-61	Hydrogen sulfide	R 12-50/53	S 26-36/37/39-45
Benzene	R 45-60-61-62-E23-E25	S 53-45-61	Chloroform	R 22-38-40-48/20/22	S 36/37	1,4-Dioxane	R 11-19-36/37-40-66	S 9-16-36/37-46
p-Benzoquinone	R 23/25-36/37/38-50	S 26-28-1.45-61	Chlorophenols	R 20/21/22-51/53	S 28-1-37	Dipropyl ether	R 11-19-66/67	S 9-16-29-33
Benzoyl chloride	R 34	S 26-45	Chlorosulfonic acid	R 14-25-37	S 26-45	E		
Benzoyl peroxide	R 2-36-43	S 3/7-14-9-24-36/37/39	Chlorotoluenes	R 20-51/53	S 24/25-61	Ethane	R 12	S 9-16-33
Benzyl chloride	R 45-E23-E25-37/38-41-E48/22	S 53-45	Chromium(VI) oxide	R 45-60-61-62-E24/25-E26				