

2024-05-16

Signature:

Operating Instructions

According to the
Betriebssicherheitsverordnung

UNIVERSITÄT
DUISBURG
ESSEN

Offen im Denken

Faculty of Chemistry

Institute: AAC

Work place: AAC Labs

EQUIPMENT

Interim gas storage (garage at refectory/S05 T01 B52) Argon bundle

DANGERS FOR HUMANS AND ENVIRONMENT



- Gas cylinders generally contain gases in a compressed state (air, oxygen, nitrogen, hydrogen,...), or in a liquefied state (ammonia, chlorine, carbonic acid, propane, butane), or as a gas in/with a carrier medium (acetylene with acetone).
- With a liquid carrier medium, the gas cylinder must **never be opened or operated lying down**. It should be noted that large quantities of gas can be released even from small cylinders.
- Some gases are odourless and tasteless.
- Gases with a molecular weight > 32 collect near the ground.
- **Danger of suffocation:** If released spontaneously, gases displace air. This can lead to dangerously low oxygen concentrations in the breathing air without being noticed.
- In the case of oxygen, it can lead to spontaneous fires in combination with organic substances. High oxygen concentrations can also be dangerous for humans.
- Compressed gases can **also have dangerous substance properties:**
 - acutely toxic
 - special health hazards (**CMR** [carcinogenic, germ cell mutagenic, toxic for reproduction], **STOT** [specific target organ toxicity], sensitising...)
 - corrosive (or irritant)
 - flammable or pyrophoric
 - oxidising
- **Explosion hazard:** If flammable gases escape, explosive gas/air mixtures are often formed.
- **Risk of poisoning** if toxic gases escape and are inhaled.
- **Risk of burns:** If corrosive gases escape, severe damage is possible by inhalation or contact with eyes and skin.

PROTECTIVE MEASURES AND RULES OF CONDUCT



- Organisational: Carry out storage and retrieval only in accordance with the rules of use and the storage instruction.
- Personal:
 - Wear protective goggles.
 - Use protective leather gloves.
 - If necessary, carry a respiratory protection mask (see instructions for use and storage).
- Technical:
 - Use only suitable means of transport (cylinder trolley).



- Secure all gas cylinders with chains to prevent them from falling over.
- Protect containers from heat.
- Leave the intermediate gas cylinder storage immediately if gases escape.
- Take injured persons out of the danger zone in self-protection (observe substance properties and oxygen deficiency).
- If the gas begins to escape, try to close the main valve, paying attention to your own safety.
- Caution: Respiratory protection mask with suitable filter can only be used for pollutant concentrations up to 1 %!
- Ask endangered persons in the surrounding work areas to leave the danger area.
- In case of *contact with clothing*, remove affected clothing immediately and allow to air.
- In case of skin contact, treat according to the substance properties, usually wash off with plenty of water. If necessary, consult a doctor.
- In case of *eye contact*, treat according to the substance properties, as a rule rinse the eyes with water for at least 15 minutes. Immediately consult an ophthalmologist.
- In case of *inhalation*:
- High concentrations of chemically inert gases may cause suffocation. Symptoms: Loss of mobility and consciousness. The affected person does not notice the suffocation. Remove injured person to fresh air using self-contained breathing apparatus. Keep warm and calm. In case of respiratory arrest, give artificial respiration. Call a doctor!
- Slightly water-soluble (corrosive or) irritant gases may cause pulmonary oedema. Use auxilosone spray immediately. Call a doctor!
- After inhalation of toxic or harmful gases, administer oxygen if possible. Call an emergency doctor!

RESPONSE TO MALFUNCTIONS



Shut down device immediately, faults must be reported to:

- Constanze Dietrich Tel.: 1834559
- Dr. Sven Meckelmann Tel.: 1833295
- Prof. Dr. Oliver Schmitz Tel.: 1833950

BEHAVIOR IN CASE OF ACCIDENT / FIRST AID



- Keep calm.
- Call first responders.
- Emergency call: 0112
- Report accident.

- Maintenance only by authorized, competent persons.
- Switch off the device and disconnect it from the mains.
- Regular inspection of wearing parts.