

Nr: 0015-R01e
2018-03-09

Operating Instructions

According to the
Betriebssicherheitsverordnung

UNIVERSITÄT
DUISBURG
ESSEN

Offen im Denken

Faculty of Chemistry

Institute: AAC

Work place: AAC Labs

Activity: Laboratory work

EQUIPMENT

Gas intermediate storage (inside / outside)

DANGERS FOR HUMANS AND ENVIRONMENT



- Gas cylinders contain normally Gases in the compressed state (air, oxygen, nitrogen, hydrogen, ...), or in the liquid state (ammonia, chlorine, carbon dioxide, propane, butane), or as gas in / with a carrier medium (acetylene with acetone). In the case of a liquid carrier medium, the gas bottle must never be opened or operated lying down. It should be noted that even small bottles can release large quantities of gas.
- Some gases are odorless and tasteless.
- Gases with a molecular weight > 32 congregate near the floor.
- **Danger of suffocation:** With spontaneous release, gases may displace air. As a result, unnoticed dangerously low levels of oxygen in the air may be the result.
- In the case of oxygen, it can lead to spontaneous fires in connection 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 mutagen, reproductive toxicity], **STOT** [specific target organ toxicity], sensitizing ...)
 - caustic (or irritant)
 - flammable or pyrophoric
 - oxidising
- **Explosion hazard:** If combustible gases escape, explosive gas / air mixtures are often produced.

- **Danger of poisoning** during the escape and inhalation of toxic gases.
- **Risk of chemical burns:** Escaping corrosive gases may cause severe damage if inhaled or in contact with the eyes and skin.

PROTECTIVE MEASURES AND RULES OF CONDUCT



Organizational

- Placing into stock an withdrawal only according to the direction for use of and the storage instructions.

Personal

- Wear safety glasses.
- Use protective leather gloves.
- If necessary, wear a respiratory mask (see use or storage instructions)

Technically

- Only use suitable means of transport (bottle cart).
- Secure all gas cylinders with chains from falling over.
- Protect containers from heat.
- Immediately leave the gas cylinder storage facility when gases escape.
- Protect injured persons under adequate self-protection (note material properties and possibly lack of oxygen) and remove them from the danger zone.
- If the outlet is just starting, try to close the main valve, paying attention to your own safety.

Caution: Respirator with suitable filter only at pollutant concentrations up to 1% usable!

- Inform the personnel of the Central Chemical Storage immediately. From there, call the fire brigade and inform them about the endangered gas cylinders.

- Request endangered persons in the surrounding work areas (waste storage, workshop ...) to leave the danger area.

Contact with clothes

- Take off affected clothing immediately and allow to air.

Skin contact

- Treat according to the material properties, i. e. usually wash with plenty of water. → if necessary turn to a doctor

Eye contact

- Treat according to the properties of the material., i. e. usually:
- Wash eyes with water for at least 15 minutes. → Immediately consult the ophthalmologist.

Inhalation

- High concentrations of chemically *inert* gases can cause suffocation.
Symptoms: loss of mobility and consciousness. The affected person does not notice the suffocation. Remove injured persons to fresh air using a self-contained breathing apparatus. Keep warm and calm. In respiratory arrest, artificial respiration. Call a doctor!
- Low water-soluble (corrosive or irritating) gases can cause pulmonary edema. Apply Auxilosonspray immediately. Call a doctor!
- If possible, administer oxygen after inhalation of toxic or harmful gases. Call the emergency doctor!

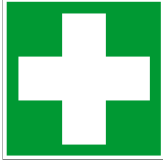
RESPONSE TO MALFUNCTIONS



Shut down device immediately, faults must be reported to:

- Maria Madani, if not present O. Schmitz, M. Sulkowski, F.Uteschil, S. Meckelmann.

BEHAVIOR IN CASE OF ACCIDENT / FIRST AID



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

MAINTENANCE / DISPOSAL

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