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Operating Instructions

According to the Betriebs-sicherheitsver-
ordnung

UNIVERSITÄT
DUISBURG
ESSEN

Offen im Denken

Faculty of Chemistry

Institute: AAC

Work place: AAC Labs

Activity: Laboratory work

EQUIPMENT

Kryomühle 6850 Freezer/Mill

DANGERS FOR HUMANS AND ENVIRONMENT



- High weight (45 kg).
- Working with cryogenic gas (liquid nitrogen).

PROTECTIVE MEASURES AND RULES OF CONDUCT



To transport the cryomill, two people should grasp the mill firmly with both hands on the sides, as it has a weight of 45 kg empty.

Transport in a filled state is not permitted.



Install the cryomill on a plain surface. Do not bend or move the PVC pipe mounted on the right rear side of the mill, otherwise moisture collected by the pipe will flow back into the mill. The pipe should be in 45° position.



Never operate the cryomill without liquid nitrogen, this cools the magnetic coil, which becomes very hot even during nitrogen-free operation of one minute and can cause damage.

Always close the lock on the right side of the coil before starting the grinder. Do not jam objects or yourself.



When filling the mill, first half of the liquid nitrogen is filled in, the Nitrogen will begin to boil strongly, but this decreases with decreasing temperature of the mill. Add the remaining amount of liquid nitrogen in portions to avoid splashing. To check the amount of nitrogen, press buttons 2 and 3 simultaneously to see if at least 3 lights are on. Otherwise, liquid nitrogen must be topped up as it is insufficient to cool the vial. When closing the cover, make sure that nothing gets trapped.

Close the lid of the mill completely before each process and check this again by pressing the switch that closes the lid.

Be careful when immersing the vial in the liquid nitrogen, it can lead to violent spraying, so this process must be done slowly.

It is to be seen until the heavy boiling of the nitrogen subsides before the vial is further submerged.

When inserting or removing the vial, make sure that the end piece is not lost, as otherwise sample material could enter the liquid nitrogen bath, causing splashes and contamination of the bath.

For easier sample removal, defrost the vial before opening it. An exception should be made when there is gas inside the vial to prevent the end cap from being ejected by the occurring overpressure.

To clean the vial, use hot water immediately after the measurement, the steel parts can be cleaned with solvent. Dry the steel so it does not rust. The plastic components can be cleaned with strong acids or bases, with appropriate protective clothing such as acid protection gloves, gowns and safety goggles. Solvents are not suitable as they attack the plastic and cause cracks.

The boiling point of liquid nitrogen is -195.8°C . When working with liquid nitrogen, therefore, low-temperature protective gloves and protective goggles must be worn. It is also to ensure that no liquid nitrogen splashes on clothing and skin, otherwise there is a frostbite risk.

Also wear the gloves when removing the vial and touching any parts of the mill.

No liquid nitrogen or generally no liquid or solid gas (dry ice) should enter the interior of the vial when it is filled. Care should also be taken when dipping the vial in the liquid nitrogen when the sample has previously been stored with dry ice. When the vial thaws again, the dry ice can go back to the gaseous state. This creates high pressures. The cylinder can break or the end pieces can be shot out. There is also a risk of contaminating the entire work area with sample material.

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.