

Institute: AAC

Work place: AAC Labs

Activity: Laboratory work

EQUIPMENT

Bruker amaZon DIP and Ion Trap

DANGERS FOR HUMANS AND ENVIRONMENT



- There is a risk of electric shock if voltage is applied during assembly or disassembly.
 - If the protective conductor is missing or interrupted, there is a risk of electric shock.
 - Danger of crushing if not installed correctly.
 - Risk of burns due to the push rod (max 400 ° C), allow to cool down before disassembling the DIP
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- There is a risk of electric shock if voltage is applied during assembly or disassembly. Bei fehlendem oder unterbrochenem Schutzleiter besteht die Gefahr eines Stromschlages.
 - Danger of crushing if not properly installed.
 - Due to the high weight of 110 kg special requirements for the workbench.
 - Move only with 4 people.

PROTECTIVE MEASURES AND RULES OF CONDUCT



- **Assembling and disassembling:**
 - During installation and uninstallation, there must be no voltage on the instrument, otherwise there is a risk of electric shock. In addition, for this reason, the voltage on the device to be installed (amaZon) should also be removed before.
 - When installing the DIP on the ion source, improper alignment of the DIP can lead to pinching in the finger area.
 - The device must be grounded before applying a voltage. Any interruption in the protective conductor inside or outside the instrument or grounding may constitute a danger to the user.
 - The push rod can reach a temperature of 400 ° C, which causes burns. Therefore, it must be cooled before uninstalling.

- When disassembling, always hold the device with one hand to prevent it from falling. It is recommended to carry out the dismantling in pairs.
- During installation and uninstallation, no gas pressure must be present.
- All connections to and from the device must be used correctly. Only original wires and cables from the manufacturer should be used.

– **Functions and handling of the device:**

- When working it must be ensured that improper handling when retracting the push rod can lead to jamming and crushing. Therefore, the push rod must not be touched during operation.
- Sharp objects, especially splintering glass, can be dangerous.
- The needle of the syringe is very sharp and must not be touched under any circumstances, there is a risk of injury or poisoning by dangerous substances.
- Never open the spray chamber during operation. (See associated MS)
- High temperatures of the ionization chamber can be dangerous, so you must not touch the heating elements in the vicinity of the ionization chamber directly after the measurement, you have to wait until they have cooled down.
- Before using the push rod it should be sufficiently cooled down, otherwise it may cause burns.
- The sample crucibles should only be used with the appropriate holder and tweezers, especially when measuring toxic or dangerous substances.
- The weighing of the samples in the sample crucibles should be done under exhaustion.

– **Use of chemicals, gases and gas cylinders:**

- Users must wear gloves and safety goggles to prevent ingestion of chemicals.
- The sample crucible contains the chemicals that are being analyzed. There are health risks posed by possible toxicity of solutions, samples, buffers and biologically hazardous aerosols of

biological samples as well as their degradation and decomposition products.

- Gas cylinders are generally explosive, even when the gases inside themselves are not explosive.
 - Gas cylinders are under high pressure. In order to avoid accidents, the safety precautions and instructions of the gas supplier must be observed. Keep gas cylinders away from the laboratory, if possible. It is best to place them outside, but never expose the gas cylinders to direct sunlight. The environment must be well ventilated. Use rigid pipes, not hoses, to transport the gas to the lab. The ambient temperature of the gas cylinder must not be higher than 40 ° C. Flammable materials must be stored at least 2 meters away from the gas bottle. Secure gas cylinders with cylinder clamps or chains so that they can not fall over.
 - When using nitrogen, ensure adequate ventilation of the workplace. Ensure a firm and proper closure of the gas supply, otherwise there is a risk of spalling. In addition, escaping nitrogen can have a suffocating effect.
 - When using oxygen, avoid open ignition sources. In addition, attention must be paid to a sufficient grounding. Oxygen connections must never be greased. At very high oxygen concentration in the air, there is a risk of spontaneous combustion of some substances.
 - The pressure regulator will be damaged if pressure above the manufacturer's instructions is used. Set the pressure of the admitted gas to the maximum allowed pressure.
- To ensure safe use of the device, it is important that the protective conductor (the green / yellow cable) of the mains connection is connected to an electrical ground. Any interruption in the protective conductor inside or outside the instrument or grounding may be a danger to the user.
 - Position the device in a clean environment that is free of dust, smoke, vibration and sunlight. Also, do not place it next to heating and cooling elements and pipes. Place the device on a flat surface that can carry the weight of 110 kg of the device. The device requires about 3 m² of space for a reliable installation.
 - Modifications, replacement of parts or repairs may only be carried out by Bruker Service Personnel or similarly trained and

authorized personnel, the same applies to maintenance work on the device and its electrical components.

- If there is any suspicion that the electrical protection status of the device is impaired, turn off the device, unplug the power cord, and secure it against unauthorized use.
- Only use fuses of the required amperage, voltage and characteristics.
- The instrument must be disconnected from the power source before it is opened.
- The liquid drain on the bottom of the spray chamber should always be connected to the waste bottle of the instrument.
- All connections to and from the device must be properly connected using only manufacturer approved cables.
- For safety reasons, the size of the room in which the machine is operated must be at least 20 m² and the height at least 2.5 m.
- Only pumps with a rated value of less than 1200 VA and leakage current below 1.0 mA can be connected to the designated port. Other pumps must be connected directly to the mains supply.
- Only distributed devices with a consumption of less than 300 VA and leakage current below 0.35 mA can be connected to the designated connection.
- Sharp objects, especially splintered glass, could pose a danger. The borosilicate capillaries may shatter during injection, so it is recommended to work with gloves. The needle is very sharp and should not be touched under any circumstances.
- The sample chamber must not be opened before the sample flow has been shut down. There is a risk of health, fire and the risk of contamination of the ambient air.
- Never open the spray chamber during operation. High temperatures of the ionization chamber (200 ° C) can be a hazard, do not touch the heating elements near the ionization chamber immediately after the measurement, but wait until they have cooled down.

- High voltages are generated in the ionization chamber. Turn them off before interacting with the chamber. If other alternatives to conventional glass capillaries are used, there is contact with the high voltage. To avoid this, always use approved parts.
- To clean the glass capillary, pull it out straight and vertically. Pressure from the side can destroy it.
- Do not place objects in front of the ventilation inlet and outlet on the front and rear of the unit.
- To check the proper functioning of the ventilation filter, check the ventilation filter below the front cover every three months.
- Protective goggles and lab coats must be worn during sample preparation and work on the device.
- Handle covers with care and do not damage them.
- There is a risk of bruising, pinching and burns while the sample is being injected. Therefore, never touch the DIP during operation.
- Einige der injizierten Chemikalien landen im Gasauslass statt im Instrument. Deswegen sollte das Auslasssystem mit einem Abzug/Schnüffelleitung verbunden sein.
- Handle all liquids with care, including the pump oil used as it may contain traces of samples and solvents.
- Wear gloves when changing the pump oil. Never add pump oil or change it while the pump is in operation.
- The oil tank lid, the pump and the pump oil can be hot. Make sure these components are cooled down before touching them.
- The gas outlet of the vacuum system and the spray chamber contain the chemicals that are being analyzed. Health risks due to the toxicity of solutions, samples, buffers and pump liquid vapor as well as biologically hazardous aerosols of biological samples should be considered. Vent all outlets of the instrument to an area from where the gas can not circulate back into the room. Do not vent to the laboratory.
- Since non-atomized liquid collects on the bottom of the spray chamber, the drain of the spray chamber must be connected to a waste bottle. The contents of the waste bottle must be treated following the rules of the Ordinance on Hazardous Substances.

- Isopropanol is used to clean the spray chamber. Wear appropriate protective clothing. Allow the chamber to cool before cleaning.
- In the determination of chlorine, methane is used. Methane is extremely flammable and can form explosive mixtures with air.
- Store containers / bottles in well-ventilated locations. Keep them away from sources of ignition. Keep the temperature below 50 ° C.
- Take preventive measures against static charges.
- The gas supply should always be closed when not in use.
- Use only methane cylinders with volumes less than 2L and pressures less than 200 bar.
- The outlet pressure should be limited to 4 bar with a pressure regulator.
- Every 3 months, the gas pipes must be checked for leaks. In this case, the pressure gauge must be able to detect pressures below 1 bar.

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.