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## OPERATING INSTRUCTIONS

According to Betriebs-sicherheitsverordnung

UNIVERSITÄT  
DUISBURG  
ESSEN

Offen im Denken

Faculty of Chemistry

Institute: AAC

Work place: AAC Labs

Activity: Laboratory work

### EQUIPMENT

#### Agilent Technologies CE/MS

#### DANGERS FOR HUMANS AND ENVIRONMENT



- By high-frequency alternating electric fields.
- Due to hot surfaces.
- By suffocating gases (Argon).
- Acids, solvents.

#### PROTECTIVE MEASURES AND RULES OF CONDUCT



- After transportation at low temperatures, the unit must remain in the package to prevent condensation until it has warmed to room temperature.
- The device requires 2.5 cm on both sides and 8 cm extra space on the back for sufficient air circulation and electrical connections.
- Make sure that the worktop holds the weight of the unit.
- The instrument must be in an upright, straight position.
- During analysis, the capillary is under high voltage, which could cause electrical shock. Isolate the capillary in the exposed areas.
- The module will continue to be powered on some parts when the power is turned off and it is plugged in. Make sure that you always have free access to the mains plug, so that there is always the chance of disconnecting the device from the power supply in case of danger. Repairs and maintenance of the module can lead to personal injury, such as electrical shock when the housing is opened and the module is connected to the power supply. Disconnect the power before opening the case. Do not connect the power cord to the device while the electronic section on the back of the instrument is open or side plates have been removed.
- Danger of electrical shock, overvoltage damage or damage to the equipment can result if connected to a mains voltage higher than indicated.

- If the device is not grounded or use of a unapproved power cord may result in electric shock or short circuit. Never use power cords different from the Agilent Technologies power cords that are manufactured for your area. Never use un-earthed devices (for example, due to the absence of the protective conductor in the supply area).
- Increased leakage current and sparking may occur during analysis if the electrodes are not completely dry. For this reason, they must be thoroughly dried before installation.
- Make sure the capillary is properly connected before applying high pressure. High pressure can flush fluids into the pressure valves and permanently damage them.
- If you pull out the fluid control module while tubings are still connected to the left side, damage to the tubings will be result and spillage may occur.
- Do not lift up the fluid control module outside the instrument. The module is connected to the central unit and can jump the track, destroying the connections.
- Fuses may only be replaced by fuses of the same value (current and characteristic). Use only fuses suitable for this device. The use of other fuses, as well as the repair or bridging of fuses is prohibited.
- The lamp can be very hot under operating conditions. Avoid touching the lamp and wear safety gloves.
- The capillaries have sharp ends and one can harm oneself. Wear goggles to protect against splinters when handling capillaries.
- The capillaries should slide directly into their fixtures without requiring much effort, otherwise they may break or become damaged. Make sure the ends of the capillaries are not bent when removing the capillary cassette. If problems occur when inserting the capillary ends into the electrode, make sure that no salt crystals block the electrodes.
- If the top cover is closed, the cartridge may be damaged if installed improperly.
- Make sure that no voltage is switched on when you come into contact with the capillary and the sprayer.
- Do not store, use or ship the unit under conditions within the temperature varies widely. Temperature fluctuations can cause condensation in the device.
- Make sure that there are no air bubbles in the vials, especially when using microvials. In the worst case, the capillaries may break by heat.

- High pressure can cause leakage inside and outside the unit.
  - Do not use pressure higher than 0.5 bar.
  - Increased temperatures can lead to deformation and leakage of the hose system.
  - Do not use liquids with a temperature higher than 50 ° C.
  - Spilling fluids can damage the electronic components of the system.
  - Do not use wet cloth during cleaning.
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- Empty all solvent hoses before opening fittings.
  - The spray shield and associated spray chamber components may be hot. Do not touch these.
  - Since the ion source operates at very high temperatures, first check for leaks and do not remove the electron ionization spray unit, the APCI / APPI, or a multi-mode source until the chamber has cooled down.
  - Do not touch the tip of the unprotected nebulizer needle, it can be easily damaged. If you damage the needle, the system performance may be affected.
  - Be careful when wiping the interior of the spray chamber that has sharp edges, such as the edge on the separator.
  - Be careful when inserting the atomizer into the spray chamber. The pointed end of the needle must pass through the narrow atomizer shaft. If the force is too high, the needle can be damaged and the acting person himself injured.
  - The needle and associated components can be very hot. Do not touch these components until they have cooled down.
  - Likewise, the pump or the filling unit may get hot, so it needs to cool down before being touched.
  - The spray chamber- and pump outlet must be vented through separate vent pipes. This can be done by a common exhaust manifold. This reduces the likelihood of exhaust from the pump entering the spray chamber when the carrier gas is not flowing. When connecting to an exhaust manifold, it must be in plumb over the pump for the gas to flow upstream.
  - Only nitrogen may be used as the atomizer gas as air, oxygen and other gases can cause explosions.
  - The solvents used can be flammable. Be careful when handling the fluids, avoid to ignite them.

- Components of the system may be damaged by caustic or aggressive buffers, organic solvents, or vaporized components. Avoid the use of such chemicals. A typical, acceptable pH range would be from 3-11, e.g. Formic acid can be used up to a concentration of 0.1%. If you still want to use any of the above fluids, do not use the CE refill system, perform the analysis with individual vials.
- The waste may possibly contain organic solvents and residues of your sample. Wear nitrile gloves and goggles when working with electrolytes and deposit garbage in a safe waste container.
- Never spray the mobile phase into the nebulizer while it is still hot, then ceramic parts may break and the organic solvents may catch fire. Likewise, direct spraying on the tip of the capillary can lead to pressure fluctuations in the vacuum system.

### RESPONSE TO MALFUNCTIONS



Shutdown device immediately, faults are to 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.