

Agilent Technologies

Innovating the HP Way

Chemical Analysis Group

^{3D}Capillary Electrophoresis Instrument

Cleaning The CE Electrodes/Prepunchers

Document A25289

Cleaning the Electrodes, Prepunchers and Insulation Plate

Objective

Buffer precipitates, dust or other solid material in the electrodes and prepunchers or under the insulation plate can cause arcing or current leakage, buffer contamination or carryover. Cleaning these parts will prevent these from occurring.

Frequency

The electrodes, prepunchers and the insulation plate must be cleaned regularly, about once a week, or if peaks show an unusual tailing or unusual peak shoulders or if arcing or current leakage can be observed or if *creeping* buffers such as urea are used.

What You Will Do

- prepare the ³DCE instrument for this task,
- remove the detector cover,
- access the electrodes,
- remove the front cover,
- access the prepunchers,
- clean the electrodes,
- clean the prepunchers,
- clean the insulation plate,
- reinstall the prepunchers, and
- reinstall the electrodes.

Instrumentation

- This SOP is applicable to the ³DCE instrument with firmware revision 1.4 or higher, built-in diode array detector with firmware revision 1.0 or higher.

Cleaning the Electrodes, Prepunchers and Insulation Plate

- 3DCE ChemStation for control and data evaluation.
- Check revision numbers: Under INSTRUMENT menu click on Revision & Serial Numbers.

Parts Required

- 12 mm hexagonal socket screwdriver (included in the startup kit).
- Pozidriv screwdriver (included in the startup kit).
- Wash bottle with isopropanol.
- Wash bottle with water.
- Compressed inert gas, oil-free.

WARNING

Follow the common safety regulations for laboratories when doing this task. Wear safety spectacles and rubber gloves. For translations, see page 214.

Preparing the 3DCE Instrument

Prior to maintenance do the following:

- 1 Select the Detector icon in the CE Diagram screen.
- 2 Select Lamp Off from the menu to switch the lamp off.
- 3 Select Maintenance from the Instrument menu to lower all lifts.
- 4 Select Exit from the File menu to exit the 3DCE ChemStation. Exit both the online and offline copy.
- 5 Turn off line power to the 3DCE instrument.
- 6 Disconnect the line power cord from the 3DCE instrument.

Removing the Detector Cover

- 1 Open the top cover.
- 2 Remove the capillary cassette.

WARNING

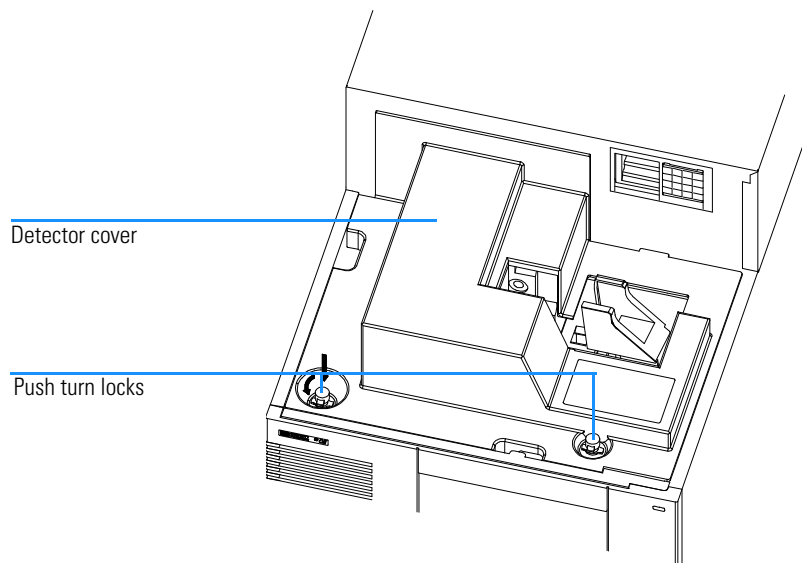
Make sure you have disconnected the line power cord of the 3DCE instrument before you proceed. For translations, see page 215.

Cleaning the Electrodes, Prepunchers and Insulation Plate

- 3 Take off the detector cover by opening the two push turn locks. To open press down and turn them counterclockwise.

Figure 74

Push Turn Locks Securing the Detector Cover

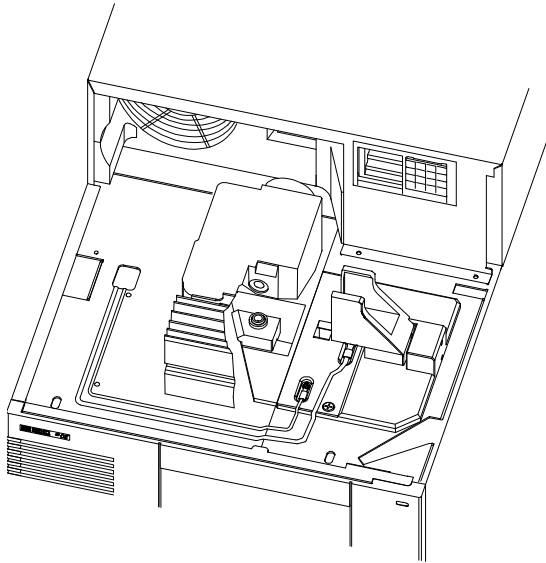


WARNING

If you were using the 3DCE instrument shortly before, the lamp may be very hot. Avoid touching the lamp or wear protective gloves. For translations, see page 216.

Figure 75

After Removing the Detector Cover

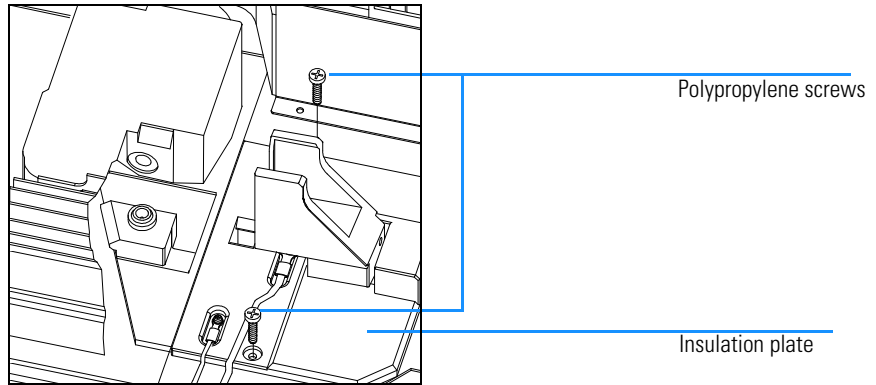


Accessing the Electrodes

- 1 Use a Pozidriv screwdriver to unscrew the two polypropylene screws which secure the insulation plate.

Figure 76

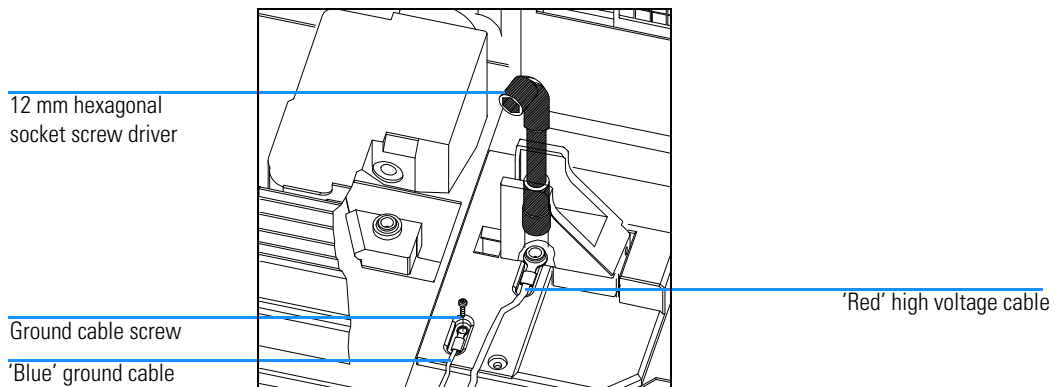
Screws Securing the Insulation Plate



- 2 Use a Pozidriv screwdriver to remove the screw that secures the blue ground cable.

Figure 77

Removing the Inlet Electrode

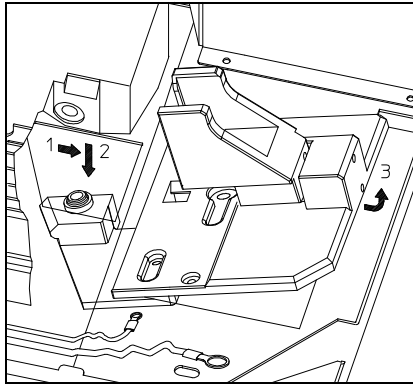


- 3 Use the 12 mm hexagonal socket screwdriver to unscrew the inlet electrode.
- 4 Carefully lift the red high voltage wire. The inlet electrode will come out.

- 5 Slowly slide the insulation plate to the right (1), tilt it up (2 and 3) and take it out. Make sure that the outlet electrode is not touching the foam of the tray cooling or the lift station.

Figure 78

Removing the Insulation Plate



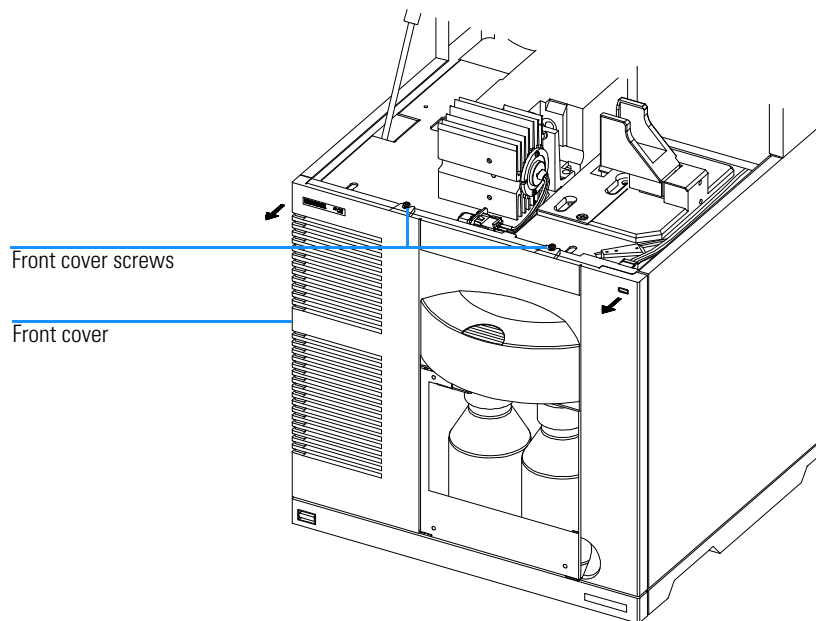
- 6 Remove the outlet electrode from the insulation plate using the 12 mm hexagonal socket screwdriver.

Removing the Front Cover

- 1 Loosen the two screws that secure the front cover. It is not necessary to remove the screws completely.

Figure 79

Removing the Front Cover

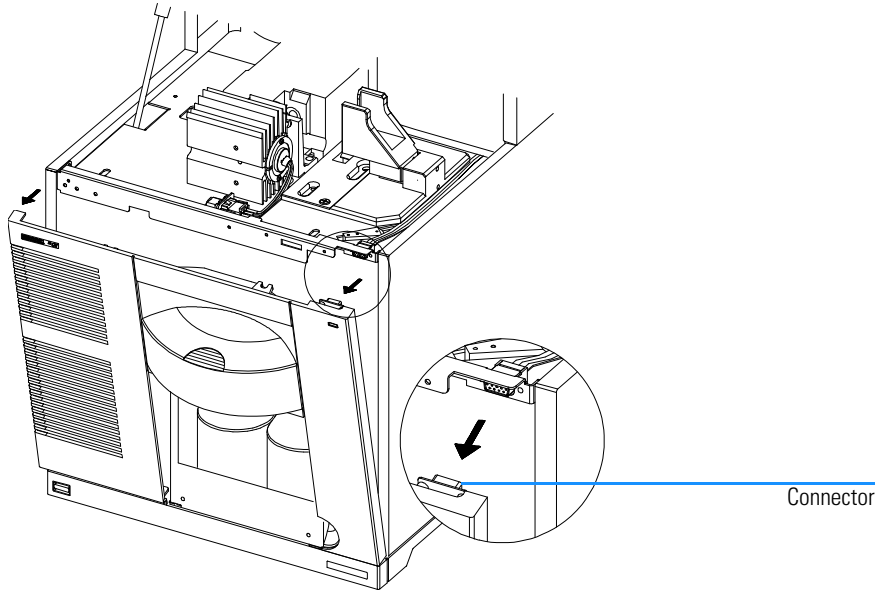


Cleaning the Electrodes, Prepunchers and Insulation Plate

- 2 Carefully pull the front cover away from the mainframe. Pull steadily at both sides. You need slightly more force to remove the right side due to a connector.

Figure 80

Connector

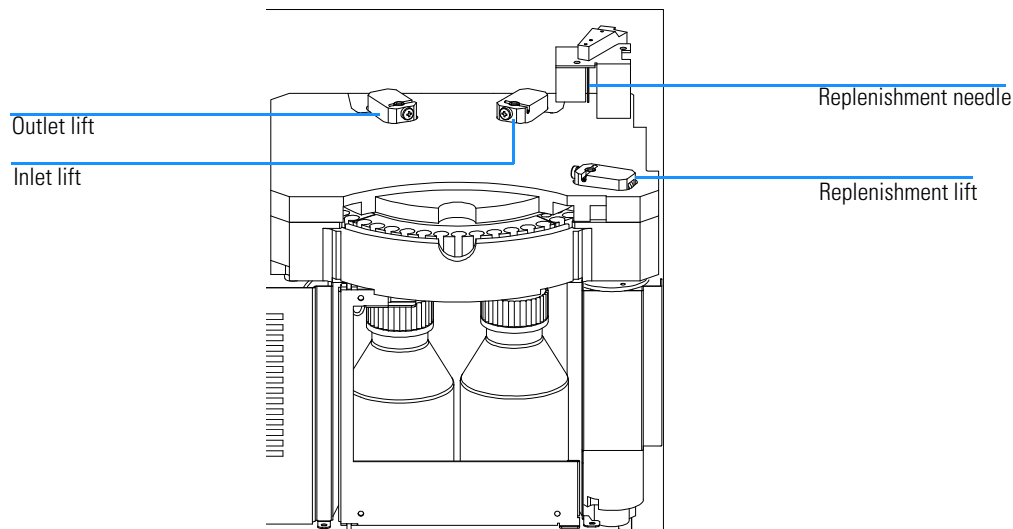


Accessing and Removing the Prepunchers

- 1 Inlet and outlet lifts are located behind the sample tray. The replenishment lift is located at the right side under the replenishment needle.

Figure 81

Position of the Lifts



WARNING

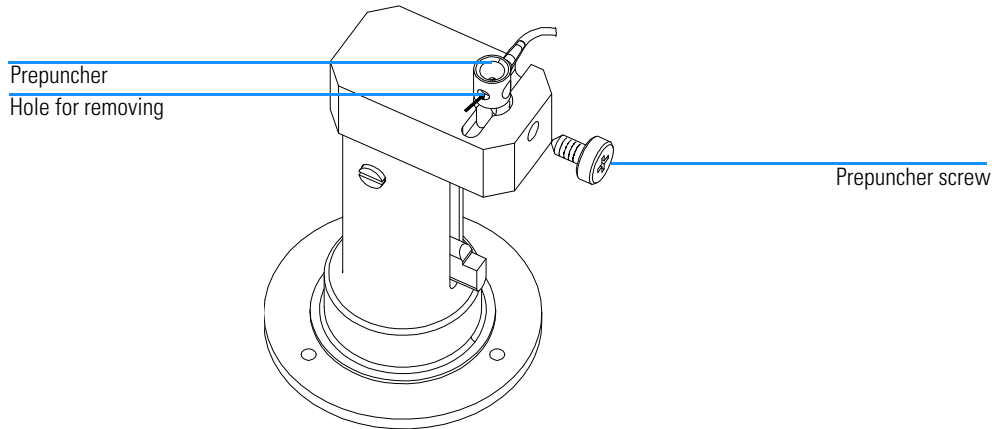
Do not touch or bend the replenishment needle. For translations, see page 217.

WARNING

The prepunchers have a very sharp tip. Be careful when touching them. For translations, see page 218.

- 2 Remove the plastic screw which secures the inlet prepuncher using a Pozidriv screwdriver.

Figure 82 **Removing the Prepuncher Screw**



- 3 The prepuncher has a hole which can be used to gently lever it out using a paper clip. Carefully pull the prepuncher out of the lift.

WARNING

Do not damage the funnel surface of the prepuncher nor the silicon air pressure tube connection. For translations, see page 219.

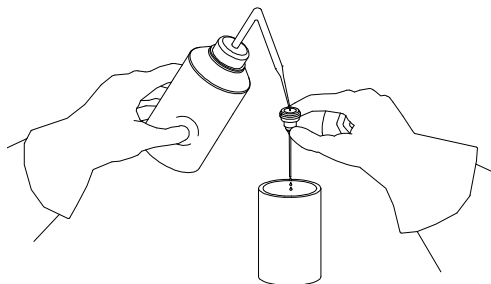
- 4 Carefully remove the air pressure tube from the inlet prepuncher.
- 5 Follow the same procedure to remove the prepuncher from the outlet lift and the replenishment lift.

Cleaning the Electrodes

- 1** Flush the electrodes with water. Watch for salt crystals. All salt crystals must be removed.

Figure 83

Flushing the Electrodes



- 2** Flush the electrodes with isopropanol.
- 3** Use compressed air to dry the electrodes and remove all traces of liquid.

CAUTION

To avoid contamination, the inside of the electrodes must be completely dry before reinstallation. For translations, see page 220.

If there is still an accumulation of dirt in the upper funnel start the cleaning procedure again or replace the electrode.

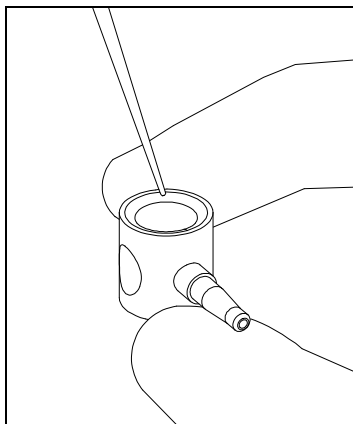
Cleaning the Prepunchers

Check for damaged tips before cleaning the prepunchers. If the tips are damaged, replace the prepunchers.

- 1 Flush the prepunchers with water. Watch for salt crystals. All salt crystals must be removed. Take particular care of the silicon air tube connector.

Figure 84

Flushing the Prepunchers



- 2 Flush the prepunchers with isopropanol.
- 3 Use compressed air to dry the prepunchers and remove all traces of liquid.

If dirt is still accumulated in the prepuncher funnel, put the prepuncher in a beaker with water and place it in an ultrasonic bath for 5 minutes followed by steps 2 and 3 of this procedure.

CAUTION

To avoid contamination the prepunchers must be completely dry before reinstallation. For translations, see page 221.

Cleaning the Insulation Plate

- 1 Moisten a tissue with water and use it to clean the insulation plate.
- 2 Moisten a tissue with isopropanol and use it to clean the insulation plate.
- 3 Dry the insulation plate with tissue and compressed air.

The insulation plate can also be cleaned in a dishwasher at a maximum temperature of 60 °C.

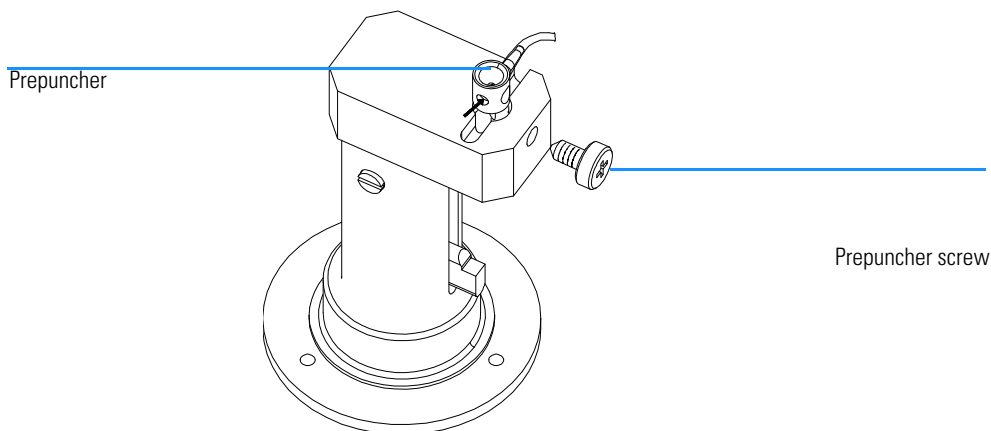
To avoid arcing the insulation plate must be completely dry before reinstallation.

Reinstalling the Prepunchers

- 1 Carefully insert the prepuncher labeled 8 into the outlet lift. Connect the tube to its connector (labeled 8).

Figure 85

Inserting the Prepuncher



The fitting of the outlet prepuncher must be tight. Otherwise problems during CEC mode may occur.

- 2 Carefully insert and tighten the plastic screw to secure the prepuncher. The prepuncher will assume its correct position as the screw is tightened.
- 3 Carefully connect the inlet prepuncher with the air pressure tube (labeled 7) connected into the inlet lift. Connect the tube to its connector (labeled 7).

The fitting of the inlet prepuncher must be tight. Otherwise pressure or injection problems may result.

- 4 Carefully insert and tighten the plastic screw to secure the prepuncher. The prepuncher will assume its correct position as the screw is tightened.

Reinstalling the Electrodes and the Insulation Plate

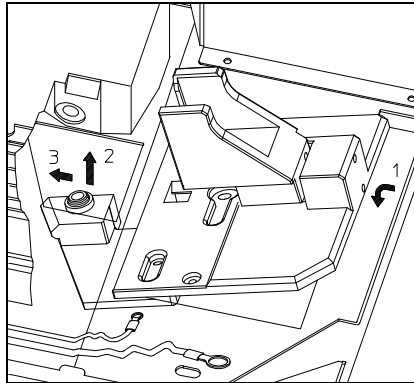
- 1 Reinstall one electrode into the outlet electrode position of the insulation plate.
- 2 Thread the electrode into place by hand . first.
- 3 Tighten the electrode with the 12 mm hexagonal socket screw driver. Do not overtighten. Do not bend the . electrodes.

Cleaning the Electrodes, Prepunchers and Insulation Plate

- 4 Holding the insulation plate by the cassette holder, slide the base plate under the detector (1) then tilt it up into place (2) and push it completely to the left (3).

Figure 86

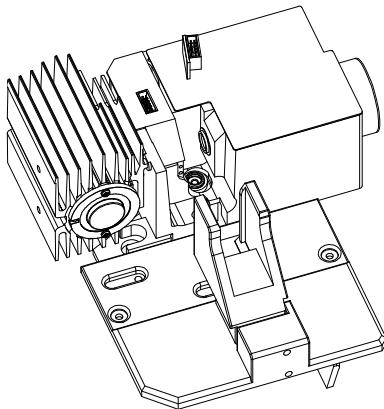
Installation of the Base Plate



- 5 The insulation base plate should be laying flat in position. The outlet electrode should be positioned correctly under the detector.

Figure 87

Alignment to the Detector



- 6 Secure the base plate by reinstalling the two plastic . screws.
- 7 Reconnect the blue ground wire and fasten the . screw.

Cleaning the Electrodes, Prepunchers and Insulation Plate

- 8** Insert the inlet electrode into the ring connector of the red high voltage wire. Thread the inlet electrode (and the ring connector) into the base plate by hand then tighten the inlet electrode with the 12 mm hexagonal socket screwdriver. Do not overtighten.
- 9** Reinstall the front cover and fasten the two screws.
- 10** Reinstall the detector cover and fasten the two push turn locks by pushing down and turning them clockwise.
- 11** Reinstall the capillary cassette.
- 12** Close the top cover.
- 13** Connect the power cord and turn on line power to the ³DCE instrument.
- 14** Start your computer and ³DCE ChemStation.