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ELUENT GENERATOR CARTRIDGES (EGC)

QuickStart Guide

EGC III KOH, (Item # 074532)
EGC-KOH (Capillary), (Item # 072076)
EGC III LiOH, (Item # 074534)
EGC III MSA, (Item # 074535)
EGC 400 KOH (Item # 302766)
EGC-MSA (Capillary), (Item # 072077)
EGC 500 KOH, (Item # 075778)
EGC III NaOH, (Item # 074533)
EGC 500 MSA, (Item # 075779)
EGC 400 MSA (Item # 302767)

1. Procedure for EGC Installation

1.1. Preparation for Installation

A. Remove the EGC from the box. Save the box and foam for future storage.

B. Configure the EG module to operate the cartridge by entering the cartridge serial number. Please refer to the EG Module and Chromeleon user manuals for detailed procedures for entering the cartridge serial number.

NOTE

- ***ICS-6000 EG, ICS-5000$^+$ EG, ICS-5000 EG, and ICS-4000 modules will automatically detect the cartridge type and do not require the serial number to be entered manually.***
- ***ICS-6000 EG, ICS-5000$^+$ and ICS-5000 EG modules require an EGC 500. EGC III or EGC (Capillary) cartridges will not be recognized by these systems and will not function.***
- ***ICS-6000 EG module requires an EGC 400 in Dual EG mode.***

C. Place the EGC on a flat surface in front of the EG module with the Eluent Generation Chamber and INLET and OUTLET fittings facing up.

D. Remove the plugs from the EGC INLET and OUTLET fittings.

E. Turn over the EGC cartridge (fittings facing down). Shake the EGC cartridge vigorously, and tap it with the palm of your hand 10 to 15 times to dislodge the air bubbles that may be trapped in the electrolysis chamber.

NOTE

Be sure to repeat Step E each time the eluent generation chamber is turned upward.

F. Connect the pump outlet to the EGC INLET port of the cartridge and the OUTLET port of the cartridge to the ELUENT IN port of the RFIC Eluent Degasser Assembly.

G. Orient the cartridge with the cable aligned with the slot in the EG holder and then slide the cartridge down into the holder until secured.

H. Connect the cartridge electrical cable to the EGC-1 port.

I. Connect the ELUENT OUT port of the RFIC Eluent Degasser Assembly to a yellow PEEK backpressure restrictor tubing (Item # 053765) with 2,000 psi backpressure at 1.0 mL/min.

1.2. Conditioning the EGC III and EGC 500 Cartridges

A. Fill a 2 L eluent reservoir bottle with ASTM filtered, Type I (18 megohm) deionized water. Connect the reservoir to the eluent inlet line of the pump.

B. Prime the pump as instructed by the system operation manual.

C. Set the pump flow rate to 1.0 mL/min. **Unscrew and remove** the plug from the vent opening on the side of the cartridge (EGC III) or the plug on the top of the cartridge (EGC 400 / 500).

D. Connect the vent fitting to the vent opening and then the vent tubing to the vent fitting. Ensure that the vent tubing is not bent, pinched, or obstructed (see **Section 1.5** below for more details).

E. Direct the outlet of the yellow PEEK backpressure tubing to a waste container.

F. Turn on the pump and pump DI water through the cartridge for 10 minutes.

G. Set the concentration to the value listed in Table 1 from the front control panel of the Chromeleon Chromatography Data System and turn on the EGC.

H. Run the EGC for the duration listed in Table 1.

I. Turn off the pump.

Table 1 EGC III and EGC 500 Conditioning Conditions

EGC Type	Eluent Flow Rate	Eluent Concentration	Duration
EGC 500 KOH, EGC III KOH, EGC III NaOH, EGC III LiOH, EGC 500 MSA, EGC III MSA	1.0 mL/min	50 mM	45 minutes

J. Disconnect the backpressure restrictor tubing from the EGC outlet tubing.

1.3. Conditioning the EGC 400 Cartridges

NOTE

EGC 400 cartridges are designed exclusively for dual EG applications.

NOTE

To ensure stable baseline and low background noise, it's crucial to have sufficient removal of the hydrogen and oxygen gases formed with the EGC generated eluents. For 1-mm system, connect the vents of the Dionex RFIC EGC 400 MSA Degasser and the Dionex RFIC EGC 400 KOH Degasser to the Vacuum Port located at the back of the Dionex DP module. For 0.4-mm system, connect the vents of the Dionex RFIC Capillary EGC MSA Degasser and the Dionex RFIC Capillary Eluent Degasser to the Vacuum Port located at the back of the Dionex DP module. Make sure all connections and fittings for the vacuum degas are vacuum tight before using the system.

A. Fill a 2 L eluent reservoir bottle with ASTM filtered, Type I (18-megohm) degassed deionized water. Connect the reservoir to the eluent inlet line of the pump. Keep the water blanketed under an inert gas (helium or nitrogen).

B. Prime the pump as instructed by the system operation manual.

C. **Remove the vent plug** on the top of the Dionex EGC 400 MSA cartridge (please refer to Dionex Eluent Generator Cartridges Manual Document No. 065081 for details about the preparation of the Dionex EGC cartridges).

D. Connect the vent fitting to the vent opening and then the vent tubing to the vent fitting. Ensure that the vent tubing is not bent, pinched, or obstructed (see Section 1.5 below for more details).

E. Connect the pump outlet to the Dionex EGC 400 MSA INLET port of the cartridge and direct the OUTLET port of the cartridge to waste.

F. Turn on the pump and pump DI water through the Dionex EGC 400 MSA cartridge for 15 minutes at the flow rate of 1 mL/min (prime mode).

G. Connect the OUTLET port of the Dionex EGC 400 MSA cartridge to a PEEK backpressure tubing (Item # 22181-20031). Direct the backpressure tubing to waste.

H. Set the pump flow rate to 0.1 mL/min.

I. On the ePanel, under Eluent Generator Tab, set the Eluent Polarity to Acidic Eluents. Set MSA_{prog} to 100 mM. Turn on the Dionex EGC power.

J. Condition the Dionex EGC 400 MSA cartridge for 30 min.

K. Turn off the pump.

L. Remove the PEEK backpressure tubing from the OUTLET port of the Dionex EGC 400 MSA cartridge.

M. Connect the OUTLET port of the Dionex EGC 400 MSA cartridge to the ELUENT IN port of the Dionex RFIC EGC 400 MSA degasser (Item # 22181-60210), and direct the OUTLET to waste.

N. Set the pump flow rate to 1 mL/min and turn the pump on for 10 min.

O. **Remove the vent plug** on the top of the Dionex EGC 400 KOH cartridge.

P. Connect the vent fitting to the vent opening and then the vent tubing to the vent fitting. Ensure that the vent tubing is not bent, pinched, or obstructed (see **Section 1.5** below for more details).

Q. Connect the ELUENT OUT port of the RFIC EGC 400 MSA degasser (Item # 22181-60210) and the INLET port of the Dionex EGC 400 KOH cartridge. Direct the OUTLET port of the cartridge to waste.

R. Turn on the pump and pump DI water through the Dionex EGC 400 KOH cartridge for 15 minutes at the flow rate of 1 mL/min.

S. Connect the OUTLET port of the Dionex EGC 400 KOH cartridge to a PEEK backpressure tubing (Item # 22181-20031). Direct the backpressure tubing to waste.

T. Set the pump flow rate to 0.1 mL/min.

U. On the ePanel, under Eluent Generator Tab, set the Eluent Polarity to Basic Eluents. Set KOH_{prog} to 100 mM. Turn on the Dionex EGC power.

V. Condition the Dionex EGC 400 KOH cartridge for 30 min.

W. On theePanel, turn the Dionex EGC power OFF and keep the pump running at 0.1 mL/min for 10 min.

X. Remove the backpressure tubing from the OUTLET port of the Dionex EGC 400 KOH cartridge.

Y. Connect the OUTLET port of the Dionex EGC 400 KOH cartridge to the ELUENT IN port of the Dionex RFIC EGC 400 KOH degasser (Item # 22181-60201).

Z. Connect the ELUENT OUT port of the Dionex RFIC EGC 400 KOH Degasser (Item # 22181-60201) to a PEEK backpressure tubing (Item # 22181-20031). Direct the backpressure tubing to waste.

AA. With EGC power OFF, turn on the pump at the flow rate of 0.1 mL/min. Flush the Dionex RFIC EGC 400 KOH Degasser (Item # 22181-60201) for 15 min.

BB. Turn off the pump.

Table 2 EGC 400 MSA and EGC 400 KOH Conditioning Conditions

EGC Type	Eluent Flow Rate	Eluent Concentration	Duration
EGC 400 MSA, EGC 400 KOH	0.1 mL/min	100 mM	30 minutes

1.4. Conditioning the capillary EGC cartridges

A. Fill a 2 L eluent reservoir bottle with ASTM filtered, Type I (18 megohm) deionized water. Connect the reservoir to the eluent inlet line of the pump.

B. Prime the pump as instructed by the system operation manual.

C. Pump DI water through the capillary EGC at 1.0 mL/min for 30 minutes (use the capillary pump in the prime mode to perform this step).

D. Connect the outlet port of the capillary EGC to a PEEK backpressure tubing that generates 2000 psi at 30 µL/min

E. Set the pump flow rate to 30 µL/min and the EGC concentration to 50 mM and condition the cartridge for 60 minutes.

F. Direct the EGC effluent to a waste container.

G. Turn off the pump.

H. Disconnect the backpressure restrictor tubing from the EGC outlet tubing.

CAUTION

After Installation: Make sure vent tubing is not constricted and is clear of obstruction. This should be performed periodically to assure the vent tubing is functioning properly.

1.5. Checking the vent tubing for obstructions

A. The gas vent lines (clear tubing) discharge the electrolysis gas (H_2 or O_2) that is vented from the Dionex EGC electrolyte reservoir and the Dionex RFIC+ Eluent Degasser.

B. The drain port removes any liquid that collects in the drip tray in the bottom of the EG. A clear corrugated drain hose is connected to this port during installation.

C. Place the free ends of the vent lines and drain hose into a waste container. To maintain a positive siphon, position the waste container below the level of the EG. A clear corrugated drain hose (P/N 055075) is connected to this port during installation

D. For correct venting and drainage, make sure the vent lines and drain hose are not bent, pinched, or elevated at any point. Do not allow the ends of the lines to be submerged in waste liquid.

E. To check for pinched or obstruction in the vent lines, use the set-up in **Figure 1** and ensure that gas bubbles are released when the EGC is in operation.

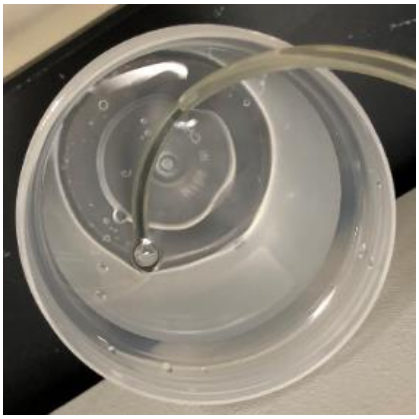

***Figure 1**: Example of the vent tubing end with bubbles releasing*

F. If bubbles are not observed, first check for the sealing of the vent fitting connections, i.e. the vent opening to the vent fitting and the vent plug to the vent tubing.

G. If no leaks are observed, then check for pinching or other restrictions in the vent line. If lines are pinched, replace the lines and repeat step E; ensure all lines are clear of restrictions.

H. Repeat steps A through G for EGC 2 vent line if using both EGCs.

I. Clearly label the two EGC vent lines as EGC 1 vent line and EGC 2 vent line.