Cadmium Column Manual

FOR NITRATE DETERMINATION

1 EACH, PN 71010

Contains: Cadmium Granules, Treated

DANGER H: H341 Suspected of causing genetic defects. H350 May cause cancer. H361fd Suspected of damaging fertility. Suspected of damaging the unborn child. H372 Causes damage to organs through prolonged or repeated exposure. H410 Very toxic to aquatic life with long lasting effects. DANGER P: P201 Obtain special instructions before use. P260: Do not breathe dust/fume/gas/mist/vapors/spray. P270 Do not eat, drink or smoke when using this product. P280 Wear protective gloves/protective clothing/eye protection/face protection. P308+P313 If exposed or concerned: Get medical advice/attention. P312 Call a POISON CENTER or doctor/physician if you feel unwell.

Read SDS (MSDS). For Laboratory Use Only.

Safety Information

Please read this entire document before unpacking, setting up, or operating the column. Do not use or install the column in any manner other than that specified in this document.

Store at 10C

to 25C

AE04-1ED

AR0616A

FIAlab

Leaders in Flow Injection Technology

Cadmium Column for Nitrate Determination

FIAlab®
Leaders in Flow Injection Technology

0. Overview

The cadmium column for nitrate determination is used in nitrate analysis for reducing nitrate to nitrite. Figure 1 shows the cadmium column and column tubing assembly. We recommend always using a switching valve with your cadmium column, in order to isolate the column from unbuffered solutions and extend its lifetime. Figures 2 and 3 show the use of a switching valve.

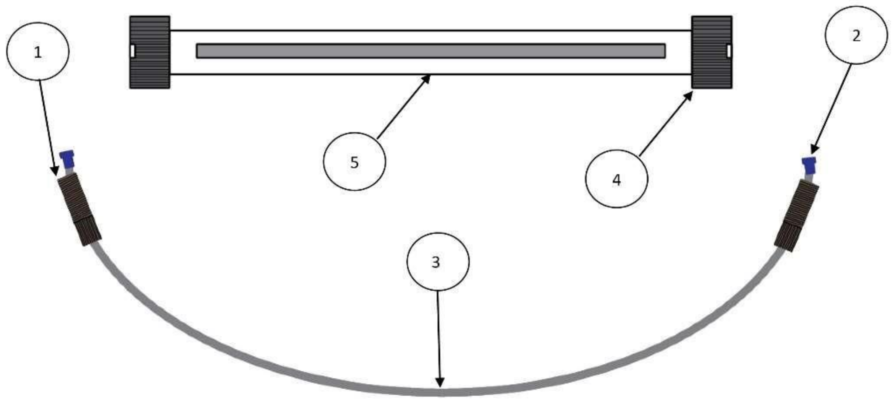

Figure 1. Cadmium column components

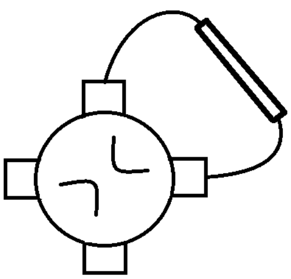

Figure 2. Cadmium column offline

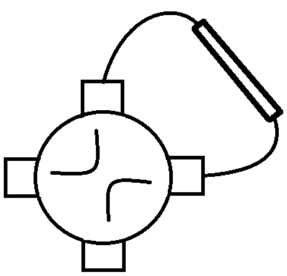

Figure 3. Cadmium column online

# On Diagram	Item Description	FIAlab Part #
1	1/4-28 Flangeless Nuts for 1/16" OD tubing, PPS.	240150
2	1/4-28 Flangeless Ferrules for 1/16" OD tubing, TEFZEL.	240070
3	Teflon Tubing, 1/16th" OD, 0.03" ID, clear	270040
4	Cadmium Column End Cap	N/A
5	Cadmium column for nitrate reduction.	71010
	4-Way Manual Switching Valve (figures 2 and 3)	24049

Cadmium Column for Nitrate Determination

1. Inspection

After unpacking the cadmium column, check for:

- Cracks in the column (if cracked, dispose of column and contact FIAlab)
- Expiration date (if past expiration it may still be usable, but could suffer from a shorter lifetime)

2. Installation

1. Wear gloves any time you are handling an open cadmium column.
2. Disconnect the old cadmium column from the switching valve mounted on your FIAlab unit.
3. Remove the end caps from the new cadmium column. Ensure that the black o-ring stays seated at the bottom of the port (the white o-ring can be removed). If the black o-ring comes dislodged while removing the end caps, attempt to re-seat it in the bottom of the port. If it will not seat properly, simply discard it, as it is not strictly necessary.
4. Attach the new column to the same tubes where you removed the old one.
5. Use the new end caps to seal the old column, and dispose of the column properly (see section 5).
6. With cadmium column off (figure 2), turn on pump, fill system with reagents, turn off pump.
7. Turn on cadmium column (figure 3), turn on pump, let run 5 minutes, turn off pump.
8. The system is now primed and the column is ready for conditioning and efficiency testing.

3. Column Efficiency

Column efficiency is a measure of the percentage of nitrate that is being reduced to nitrite. New columns should be tested for efficiency to make sure they are performing acceptable. Columns should be tested periodically to ensure they are maintaining acceptable efficiency. Column efficiency can be tested as follows:

1. Calibrate using nitrate (NO_3^-) standards.
2. Run a known concentration of nitrate (NO_3^-) to get a measured concentration of **nitrogen with source nitrate**, [N-NO_3^-].
3. Run the same concentration of nitrite (NO_2^-) to get a measured concentration of **nitrogen with source nitrite,** [N-NO_2^-].
4. The column efficiency, e, is determined by the following equation:

$$e = \frac{[N - NO_3{}^-]}{[N - NO_2{}^-]} * 100\%$$

5. If efficiency is below your lab's cutoff %, it is recommended that you replace the column. (Typical cutoff percentages tend to range from 75% to 90%).
6. If efficiency is above 105%, as can sometimes happen with new columns, the column should be "conditioned" by making ten replicate injections of your highest level nitrate standard.

4. Troubleshooting

If a leak is detected on one of the ends of the column:

1. Ensure the nut is properly tightened on the end of the column with the leak.
2. Ensure the tubing is properly inserted by gently pulling the tubing away from the column. If inserted properly, it should not come loose.
3. If none of the above solves the issue, contact FIAlab for assistance.

5. Disposal

Spent cadmium columns should be properly disposed of by following all applicable local, state, and federal guidelines.

<u>Contact Information</u>

For reorders: sales@flowinjection.com

For support: support@flowinjection.com

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