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# Lachat: NO3 Protocol

USDA<sup>1</sup><sup>1</sup>USDA

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Works for me

This protocol is published without a DOI.

PDI Test

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## ABSTRACT

Lachat NO3 Protocol.

## PROTOCOL CITATION

USDA 2021. Lachat: NO3 Protocol. [protocols.io](https://protocols.io/view/lachat-no3-protocol-btwwnpfe)  
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## KEYWORDS

Lachat, NO3, Protocol

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## CREATED

Apr 02, 2021

## LAST MODIFIED

Apr 05, 2021

## PROTOCOL INTEGER ID

48822

## DISCLAIMER:

**\*\*The Lachat should be checked every 30 minutes during operation. Do not operate the Lachat if no one is around to monitor the instrument and address any problems arise. \*\***

- 1 Assemble all reagents/standards and check all reagent/standard levels to ensure you have enough to complete your analysis.

### IF STANDARDS AND SAMPLE WERE REFRIGERATED ALLOW >30 MIN TO WARM

2 Reagents, Marked NO<sub>3</sub>/NO<sub>2</sub>

- Sulfanilamide Color Reagent
- Ammonium Chloride Buffer

1 Carrier. **WILL ALWAYS MATCH YOUR EXTRACTANT.**

- 2M KCl or
- DI Water

- 2 Set up the pump by attaching all the tubing from the Nitrate/Nitrite manifold. Inspect tube lines to make sure they are seated between the plastic guide rails.
  - 3 lines will be used for the Nitrate/Nitrite manifold (2 reagents, 1 carrier)

- 1 Sample line
  - 1 Needle rinse line
- 3 Place reagent and carrier lines into the DI and start the pump.
- The pump speed should be set to 35.

3.1 Make sure all lines have proper flow by visually watching the fluid flow through the line.

3.2 If you miss the flow momentarily remove the line and watch the resulting air flow.

3.3 Ensure that all lines are flowing allow >10min for the DI water to flush the lines.

- 4 Open the Omnion software by double-clicking on the Icon on the desktop.

4.1 Now click open on the toolbar. Then open folder path  
C:\Program\_Files\Lachat\Omnion\Data\Methods\Nitrite-Nitrate

4.2 Choose the appropriate file for the experiment.



## 5 DO THESE SAMPLES NEED TO BE DILUTED WHEN ANALYSING NO<sub>3</sub>?

Did anyone else run dilutions today? The software will start in the dilution rack based upon the last dilution tube used while the software was still opened.

- To avoid accidents close and restart Omnion

- 5.1 If yes, fill up dilutor bottles
- DI water in the DI Dilutor bottle
  - Extractant Dilution Solution – Same as carrier
  - Ensure the dilutor is ready for the run by clicking on configuration on the toolbar, followed by autosamplers. This will open up a menu where you can prime the dilutor for operation.
- After priming, decide if you want a manual/forced ADF or a ADF based upon % from Standards
- The manual dilutes regardless of data output (**TYPICAL**)
  - The ADF will add additional samples with dilutions based upon the output being outside a parameter. (**ATYPICAL**)

**With either setting take the time to prepare enough tubes in the dilution rack to prevent sample from being ejected onto the tray because of a missing test tube**

5.2 If no, proceed to #6.

- 6 Once the DI water has flushed the lines remove each line from the DI water. Wipe the line and inlet with a Kimwipe to remove any excess water.

6.1 Watch lines for proper flow.

6.2 If you miss the flow momentarily remove the line and watch the resulting air flow.

6.3 Ensure that all lines are flowing allow >10min for the reagents to run through the lines and come to a stable baseline.

6.4 Use the preview button to monitor the voltage output. Make sure to give ample time and visually inspect that the baseline is stable and at an acceptable value.

- 7 During the stabilizing time while air bubbles and reagents are flowing through the Lachat system place your samples into the rack base.

7.1 Before placing the rack double check the order of the samples and compare this order of the Sample ID column in Omnicion.

7.2 Next check the cup ID column. The number should go in numerical. It is important to check this column when amending an old run setup and adding new samples.

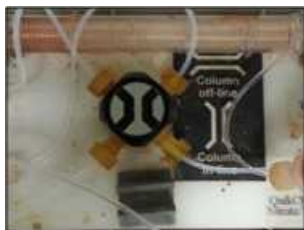
7.3 Check that replicates are included in the run order and occur at least once for every 10 samples.

- 8 **After you have a stable baseline you can Engage the cadmium column.**

- Failure to do so will damage the cadmium column, reducing the reduction efficiency.

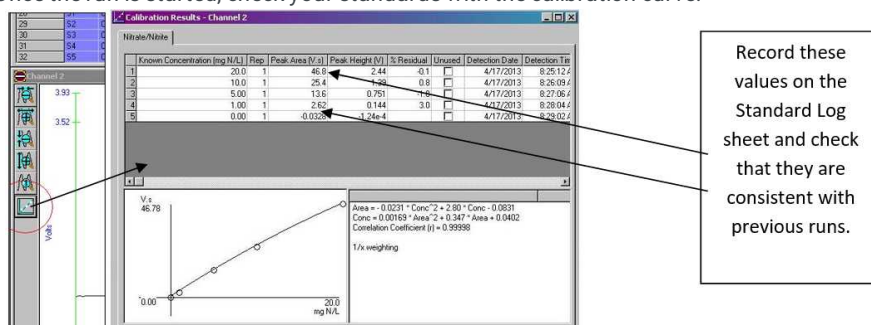
- 9 **Before starting the analysis double-check the following:**

- **The NO<sub>3</sub> standards are in the standards rack and ordered from 20ppm to 0ppm.**
- **The NO<sub>2</sub> standards are also in the standard rack.**
- NO<sub>3</sub> and NO<sub>2</sub> are set to run as unknowns after NO<sub>3</sub> standards are run. The values of these unknowns are used to calculate reduction efficiency
- **The sample rack is optimally seated with the individual test tubes being aligned to prevent obstruction to sampling needle.**
- **The column is engaged for NO<sub>3</sub>.**
- **Samples are in the correct order in both the rack and software.**



10 Unclick the preview button and start the run.

11 Once the run is started, check your standards with the calibration curve.



12 Watch the autosampler enter the first sample and adjust sample tubes as needed

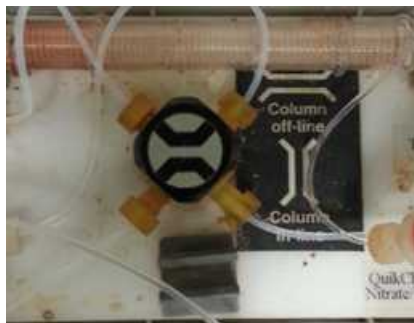
13 Once your run is completed export the data by clicking on the run tab found in run properties window. This will populate an Excel file with the run data. Find the raw data (Lachat Raw Data) folder on the desktop and open it.

13.1 Open the file and use Save As to copy the file under a logical name in the Lab Studies or corresponding folder location.

13.2 Sort the data in a descending chronological order by clicking on the data modified title column and find your run.

- The Lachat raw data file is periodically purged and for that reason data should NEVER be left here without a copy.

13.3 **\*\*\*\*\*BEFORE REMOVING THE LINES FROM REAGENTS TURN CADMIUM COLUMN OFFLINE\*\*\*\*\***



- 14 Remove the reagent lines slowly while wiping the line and inlet with a Kimwipe to remove excess reagent/carrier.
  - 14.1 Use a new clean Kimwipe with each line to prevent contamination.
  - 14.2 Take caution to ensure the lines do not splash or drip reagent or carrier.
  - 14.3 Place lines into DI for a **minimum of 15 min** flushing to clean the lines.
- 15 Remove the reagent from the DI water, wiping the line and inlet with a Kimwipe to remove excess DI water.
  - 15.1 Continue to run pump pushing air through the line for 15 minutes to dry the lines.
  - 15.2 Visually inspect the entirety of the lines to ensure they are dry.
- 16 You can now close down the Omnicion software and shutdown the power to the system by hitting the breaker on the power strip.
  - Remember to remove lines from pump and store them out of the way of other manifold lines.