Portelite™ Fluorimetric Lithium Ion Quantification Kit

Catalog number: 21353
Unit size: 50 Tests

Component	Storage	Amount (Cat No. 21353)
Component A: Lithiumighty™ 520	Freeze (< -15 °C), Minimize light exposure	1 Vial
Component B: Assay Buffer	Refrigerated (2-8 °C)	1 Bottle (20 mL)
Component C: Lithium Standard	Refrigerated (2-8 °C)	1 Vial (15 mg)
Component D: DMSO	Refrigerated (2-8 °C)	1 Vial (100 µL)

OVERVIEW

Portelite™ Fluorimetric Lithium Ion Quantification Kit™ uses our robust lithium ion indicator dye, Lithiumighty™ 520, which exhibit great fluorescence intensity enhancement upon binding to Lithium ions. Lithiumighty™ 520 is the most robust lithium ion indicator with high selectivity. It enables the kit to be useful for the rapid determination of lithium concentrations in a variety of samples compared to the other commercial lithium ion assays. This nanodrop-based assay kit requires a small amount of sample, it is particularly suitable for the determination of lithium ion concentration in fields or on site. Quantifying lithium ions is important in various scientific fields and industries, including biochemistry, medicine, environmental analysis, and food science etc. The rapid and accurate determination of lithium ions is particularly important in the battery industry. There are several methods commonly used to quantify lithium ions, including flame photometry, ion-selective electrodes (ISE), atomic absorption spectroscopy and fluorescence spectrophotometry. Flame photometry and atomic absorption spectroscopy require the inflammation of the samples. They are tedious to use and require expensive and sophisticated instrumentation. Ion-selective electrodes require large volumes of samples and often have low selectivity. Among all the methods, fluorescence spectrophotometry is the most convenient method for quantifying lithium ions. Fluorescence spectrophotometry involves complexing lithium ions with specific reagents and measuring the resulting fluorescence changes. However, there is still a lack of a fluorescence-based lithium ion assay kit in the commercial market due to the absence of a robust fluorescence lithium ion indicator. For the first time, Lithiumighty™ 520 filled this gap. It is the best fluorescent lithium ion indicator for rapidly determining lithium ion concentration in combination with a fluorescence device such as a fluorescence Nanodrop spectrophotometer or a fluorescence microplate reader.

AT A GLANCE

Important Note

Thaw all the kit components at room temperature before starting the experiment.

Protocol Summary

1. Prepare the Lithiumighty™ 520 working solution.
2. Add 100 µL of the Lithiumighy™ 520 working solution to each 0.2 mL PCR tube.
3. Add 100 µL of the Lithium Standards or test samples into each tube.
4. Incubate at room temperature for 5-10 minutes.
5. Monitor the fluorescence intensity with a CytoCite™ fluorometer or Qubit™ fluorometer.

KEY PARAMETERS

CytoCite Fluorometer

Emission	530 nm
Excitation	480 nm
Instrument specification(s)	0.2 mL PCR tube

Qubit Fluorometer

Emission	530 nm
Excitation	480 nm
Instrument specification(s)	0.2 mL PCR tube

PREPARATION OF STOCK SOLUTIONS

Unless otherwise noted, all unused stock solutions should be divided into single-use aliquots and stored at -20 °C after preparation. Avoid repeated freeze-thaw cycles

Lithiumighty™ 520 Stock Solution

1. To prepare a Lithiumighty™ 520 stock solution, add 100 µL of DMSO to the vial containing Lithiumighty™ 520 (Component A).

   Note: Prepare a single aliquot of unused Lithiumighty™ 520 stock solution and store it at ≤ -20 °C, protected from light. Avoid freeze/thaw cycles.

PREPARATION OF STANDARD SOLUTIONS

For convenience, use the Serial Dilution Planner:
https://www.aatbio.com/tools/serial-dilution/21353

Lithium Standard
Add 350 µL of distilled water to the Lithium Standard vial (Component C) to prepare a 1 M standard stock solution. Next, dilute this 1 M stock solution with Assay Buffer to achieve a 300 mM solution (LS1). Then, perform 1:2 serial dilutions of the 300 mM solution to obtain a series of lithium standards (LS2 to LS7).

PREPARATION OF WORKING SOLUTION

Lithiumighty™ 520 Working Solution

1. Prepare the Lithiumighty™ 520 working solution by adding 100 µL of Lithiumighty™ 520 (Component A) to 5 mL of Assay Buffer (Component B), and protect the working solution from light by covering it with foil or placing it in a dark location.

   Note: For optimal results, use this solution within a few hours after preparing it.

Note: 5 mL of working solution is enough for 100 tests.

SAMPLE EXPERIMENTAL PROTOCOL

Important Note

The acceptable sample volume can range from 1 to 20 µL, depending on the estimated concentration of the sample. The following protocol is based on a sample volume of 10 µL.

1. Add 100 µL of Lithiumighty™ 520 working solution to each Cytocite™ sample tube (Cat No. CCT100) or an equivalent 0.2 mL PCR tube.
2. Add 100 µL of Lithium Standards or test samples to each tube. Mix each tube by vortexing for 2-3 seconds.
3. Incubate all the tubes at room temperature for 5-10 minutes.
4. Insert the samples into either the CytoCite™ or Qubit™ devices. Use the green fluorescence channel to measure the fluorescence intensity. Be sure to follow the specific procedures for the CytoCite™ Fluorometer. For detailed instructions, refer to the link below:

   https://devices.aatbio.com/documentation/user-manual-for-cytocite-fluorometer

Preparation of Standard Calibration Curve

For Portelite™ assays, you can create a calibration curve using the Lithium Standards. Below is a simple protocol for generating a customized Lithium standard curve.

1. Perform a 1:2 serial dilution. First, add Lithium Standard (Component C) into the Assay Buffer (Component B). Then, create the following Lithium standard dilutions: 300 mM, 150 mM, 75 mM, 37.5 mM, 18.75 mM, 9.375 mM, and 4.6875 mM.

   Note: Final, in well concentration of the sample, will be 150, 75, 37.5, 18.75, 9.37, 4.68, 2.34 mM.
2. Add 100 µL of the Lithiumighty™ 520 working solution to each tube.
3. Add 100 µL of either standards or samples into a 0.2 mL PCR tube.
4. Incubate the reaction at room temperature for 2 minutes.
5. Insert the samples into the CytoCite™ device and use the green fluorescence channel to monitor the fluorescence intensity.

EXAMPLE DATA ANALYSIS AND FIGURES

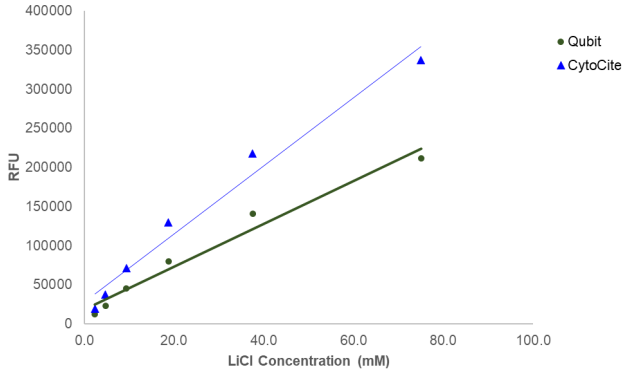

Figure 1. The lithium standard curve was generated using the Portelite™ Fluorimetric Lithium Ion Quantification Kit.

DISCLAIMER

AAT Bioquest provides high-quality reagents and materials for research use only. For proper handling of potentially hazardous chemicals, please consult the Safety Data Sheet (SDS) provided for the product. Chemical analysis and/or reverse engineering of any kit or its components is strictly prohibited without written permission from AAT Bioquest. Please call 408-733-1055 or email info@aatbio.com if you have any questions.