Portelite™ Fluorimetric Sodium Ion Quantification Kit

Catalog number: 21327
Unit size: 50 Tests

Component	Storage	Amount (Cat No. 21327)
Component A: SoNa™ 520	Freeze (< -15 °C), Minimize light exposure	1 Vial
Component B: Assay Buffer	Freeze (< -15 °C), Minimize light exposure	1 Bottle (20 mL)
Component C: Sodium Standard	Refrigerated (2-8 °C)	1 Vial (5 mg)
Component D: DMSO	Refrigerated (2-8 °C)	1 Vial (100 µL)

OVERVIEW

Portelite™ Fluorimetric Sodium Ion Quantification Kit™ uses our robust sodium ion indicator dye, SoNa™ 520, which exhibit great fluorescence intensity enhancement upon binding to sodium ions. SoNa™ 520 is perhaps the most robust sodium ion indicator with high selectivity. It enables the kit to be useful for the rapid determination of sodium concentrations in a variety of samples compared to the other commercial sodium ion assays. This nanodrop-based assay kit requires a small amount of sample, it is particularly suitable for the determination of sodium ion concentration in fields or on site. Quantifying sodium ions is important in various scientific fields and industries, including biochemistry, medicine, environmental analysis, and food science etc. There are several methods commonly used to quantify sodium 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 sodium ions. Fluorescence spectrophotometry involves complexing sodium ions with specific reagents and measuring the resulting fluorescence changes. SoNa™ 520 is perhaps the best sodium ion indicator for rapidly determining sodium 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 test samples and serially diluted sodium standards.
2. Add 100 µL of the SoNa™ 520 working solution to your test samples.
3. Incubate at room temperature for 5-10 minutes.
4. 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

SoNa™ 520 Stock Solution

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

   Note: Prepare a single aliquot of unused SoNa™ 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/21327

Sodium Standard
Add 300 µL of distilled water to the Sodium Standard vial (Component C) to prepare a 250 mM standard stock solution. Next, dilute this 250 mM stock solution with Assay Buffer to achieve a 40 mM solution (SS1). Then, perform 1:2 serial dilutions of the 40 mM solution to obtain a series of sodium standards (SS2 to SS7).

PREPARATION OF WORKING SOLUTION

SoNa™ 520 Working Solution

1. Prepare the SoNa™ 520 working solution by adding 100 µL of SoNa™ 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 nucleic acid sample. The following protocol is based on a sample volume of 10 µL.

1. Add 100 µL of SoNa™ 520 working solution to each Cytocite™ sample tube (Cat No. CCT100) or to an equivalent 0.2 mL PCR tube.
2. Add 100 µL of Sodium 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 Sodium Standards. Below is a simple protocol for generating a customized Sodium standard curve.

1. Perform a 1:2 serial dilution. First, add Sodium Standard #2 (Component D) into the Assay Buffer (Component B). Then, create the following Sodium standard dilutions: 40 mM, 20 mM, 10 mM, 5 mM, 2.5 mM, 1.25 mM, and 0.625 mM.

   Note: Final, in well concentration of the sample, will be 20, 10, 5, 2.5, 1.25, 0.625, 0.3125 mM.
2. Add 100 µL of the SoNa™ 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 5-10 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

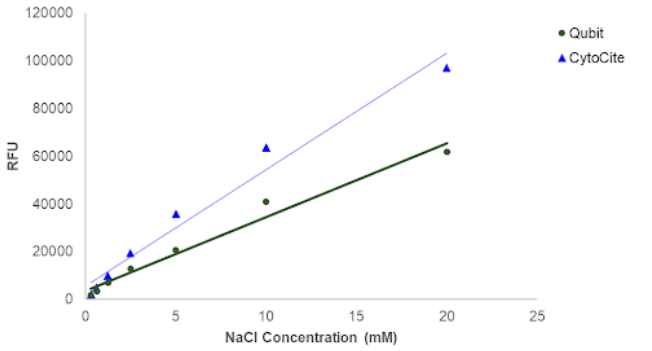

Figure 1. The sodium standard curve was generated using the Portelite™ Fluorimetric Sodium Quantitation Kit.

DISCLAIMER

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