

QWIKLITE™ TECHNICAL APPLICATION NOTE



Ammonia Reference Testing Using the QwikLite™ 200 Testing System

Ammonia is an important source of nitrogen for living systems. Although atmospheric nitrogen abounds, few living creatures are capable of utilizing this nitrogen. Ammonia also plays a role in both normal and abnormal animal physiology. Ammonia is created through normal amino acid metabolism and is toxic in high concentrations.

Reference testing is done with known chemicals or substances to establish a baseline or initial set of results. Several standard chemicals or compounds can be utilized. In this example, Ammonia Standard Solution, 1000ppm (as NH_4^+) will be used. Artificial Sea Water (33ppt salinity) is also needed in this experiment. To ensure consistent salinity, the Ammonia Standard Solution, originally ~0ppt, should be adjusted using sea salt to a salinity of ~33ppt (Refer to the Technical Application Note "How to Measure and Adjust Salinity in Water Samples for the QwikLite™ 200 Testing System").

There are six cartridges in the Disposable Test Kit; each contains six clear square test tubes called cuvettes. The cuvettes contain a solution of bioluminescent marine plankton and seawater. Handle the cartridges with care and do not remove the cuvettes. All six cartridges will be used in this test to provide good results.

The table below is the Experimental Design to be used in the preparation of the concentrations to be added to the cartridges (2.75 mL to each cuvette). These solutions should be made in a clean, 25 mL Erlenmeyer flask, pre-rinsed with artificial seawater. The first row in the table is the instruction to make the Control (no ammonia is added); this solution will be added to the cuvettes in cartridge #1. The second row of the table is to make the next concentration for cartridge #2. Notice that a small amount of Ammonia is added ($0.00125 \text{ mL} = 1.25 \text{ uL}$) to the flask; Sea Water is added as well (21.149 mL).

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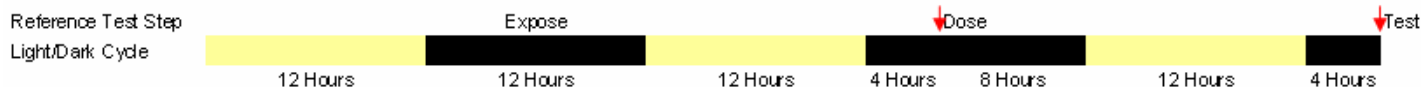
Reference Test Steps

1. Upon receipt of the cartridges, begin the light cycle exposure (see example Light Cycle Diagram below):
 - a. Expose to light for 8-14 hours
 - b. Expose to dark for 8-14 hours
 - c. Expose to light for 8-14 hours
 - d. Expose to dark for 4 hours
2. Prepare sample
 - a. Adjust salinity of NH₄ to ~33ppt
 - b. Make 6 flasks of samples (see table below)

Experimental Design: Ammonia Reference Test			
Flask	Concentration (ppm)	Ammonia Volume	Sea Water Volume (mL)
1	0.0	0.000	21.150
2	0.05	0.00125 mL = 1.25 uL	21.149
3	0.5	0.0125 mL = 12.5 uL	21.138
4	5.0	0.125 mL = 125 uL	21.025
5	50.0	1.25 mL	19.900
6	500.0	12.5 mL	8.650

3. Dose: Pipette 2.75 mL of the respective concentration into each cuvette in the respective cartridges (Flask # = Cartridge #).
4. Light Cycle (minimum exposure to sample is 24 hours); optimum exposure for this reference test follows:
 - a. Expose to dark for 8 hours
 - b. Expose to light for 12 hours
 - c. Expose to dark for 4 hours
5. Test: Use the QwikLite™ 200 Testing System QwikLite™ Research Mode Data Acquisition Application (DAA) to test.

Light Cycle Diagram



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