



Total Alkalinity Titration System model AS-ALK2

Specifications

1. Mode: automated open cell Gran titration
2. Typical sample consumption range: 10 – 25 mL per analysis
3. Time consumption: 7 – 10 minutes
4. Precision: better than $\pm 0.1\%$ or $\pm 2 \mu\text{M}$ for seawater
5. Work environment: shipboard or land-based laboratory
6. Power requirement: 100 – 240 VAC
7. Size: 11" H \times 9" D \times 12" W

Description

The AS-ALK2 total alkalinity titrator consists of two high precision digital pumps (adjustable from 1 to 25 mL) for precise delivery of reagent and sample solutions (Kloehn, USA), a research quality pH meter (Fisher Thermo Orion, USA), and combination glass pH electrode (Orion, USA). A laptop PC is also included as part of the data acquisition unit.



Figure 1. Front view of the total alkalinity titrator.

The AS-ALK2 total alkalinity titrator has been tested in a variety of aquatic conditions such as in river and lake waters, coastal and open ocean waters, sediment porewater, and groundwater. This system is unique in that it automates the Gran (linear) titration method with high precision ($\pm 0.1\%$). Further, it is built and tested for shipboard use. To ensure high quality data, a water bath should be used to help maintain a constant temperature throughout the titration analysis. This model is not available from any other commercial source.

If the sample volume is small or not sufficient enough to rinse/flush the sample (left) syringe of the previous solution, it is possible to use the titrator without the sample syringe. In this circumstance, an analytical balance is used to weigh the sample. The amount is then keyed into the program before the automated titration is initiated. Final alkalinity values are calculated via internal software.

Results

On October 10th, 2016, the same coastal seawater was repeatedly tested (20 measurements) using sample volumes of 20 mL. Seawater was collected at the Indian River Inlet, southern Delaware, USA. The coefficient of variation for all test measurements was 0.081%. Therefore, results better than $\pm 0.1\%$ are possible if multiple analyses for the same water sample are performed under stable room temperature conditions.

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Figure 2. Total alkalinity test bench.

Additional Information

Table 1. Repeated total alkalinity measurements of the same coastal seawater.

Alkalinity Titrator Test Report

ALK Titrator Model: AS-ALK2
Serial Number: A21616
Sample Type: Seawater Sample Volume: 20 mL
Tested Electrode#: B-UV1-15622

#	Date	TA [μmol/L]
#1-1	10/11/16 10:59	2132.0
#1-2	10/11/16 11:07	2133.2
#1-3	10/11/16 11:14	2132.5
#1-4	10/11/16 11:20	2129.5
#1-5	10/11/16 11:27	2134.0
#1-6	10/11/16 11:47	2134.0
#1-7	10/11/16 11:55	2134.8
#1-8	10/11/16 12:03	2135.3
#1-9	10/11/16 12:10	2130.8
#1-10	10/11/16 12:18	2130.2
#1-11	10/11/16 13:49	2133.0
#1-12	10/11/16 13:56	2131.5
#1-13	10/11/16 14:03	2129.9
#1-14	10/11/16 14:10	2133.6
#1-15	10/11/16 14:25	2133.0
#1-16	10/11/16 14:32	2133.0
#1-17	10/11/16 14:40	2131.8
#1-18	10/11/16 14:47	2130.8
#1-19	10/11/16 14:54	2129.8
#1-20	10/11/16 15:03	2130.7
	Average:	2132.2
	Standard Deviation:	1.732
	Coefficient of variation:	0.081%

NOTE: Data influenced by air bubbles have been removed