

Spring 2010

Atlantic Canada



Introducing the Skalar SP50 Robotic Analyzer

Recently, Maxxam's Bedford location has added a Skalar SP50 Robotic Analyzer to the General Chemistry section. This instrument is a product of Skalar International B.V., a company established in 1965 as a manufacturer of analyzers for the laboratory and process industry with headquarters in Breda, The Netherlands.

Initially, this instrument will be used in the analysis of Biochemical Oxygen Demand (BOD). Much of the background information below is from our BOD Standard Operating Procedure (SOP).

Introduction to BOD

The most frequent damage caused by the discharge of wastes to natural water is the reduction of dissolved oxygen concentrations to levels that cannot support normal aquatic life. This oxygen depletion arises via the bacterial oxidation of organic material and eventually leads to a general deterioration of water quality.

Analysis of Biochemical Oxygen Demand (BOD) determines the relative oxygen requirements of wastewaters, effluents, and polluted waters. This test measures the dissolved oxygen consumed during a five-day

incubation period resulting from the biochemical degradation of organic material (carbonaceous demand) and the oxygen used to oxidize inorganic material such as sulfides and ferrous iron. As well, oxidation of reduced forms of nitrogen, mediated by microorganisms, can exert a nitrogenous demand. Measurements that include nitrogenous demand are not useful for assessing the oxygen demand associated with organic material. Chemical inhibition of nitrogenous demand provides a more direct and reliable measure of carbonaceous demand. Data

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ceo's note



What a difference a year makes!

A year ago, Canada was in the middle of a recession and signs of weakness across the environmental industry were everywhere. Fast forward to today and the general consensus is that the recovery is positively impacting our industry. The phrase that best describes the prevailing mood is “cautious optimism,” and we would agree. Although I’m an optimist by nature, I believe that this is a fragile recovery. The real risk to Canada will come from outside our borders (Greece’s debt crisis, China’s economic bubble, the United States’ economic recovery, et cetera). Still, it is great to see activity pick up.

For our part, we’re using this year to make some important investments in our business through technology and service upgrades throughout the country. We will be strengthening our commitment

to cross country coverage and new services in response to your input. Watch for more on these developments in the coming months.

The purpose of this newsletter is to inform you of developments in our industry, often technical

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in nature. We’re conscious of making the most of your time, and I’d like to ask that you let us know how we’re doing and/or provide suggestions on matters that are important to you for future editions of Benchtalk.

All the best for a safe and successful summer. 

Jon Hantho

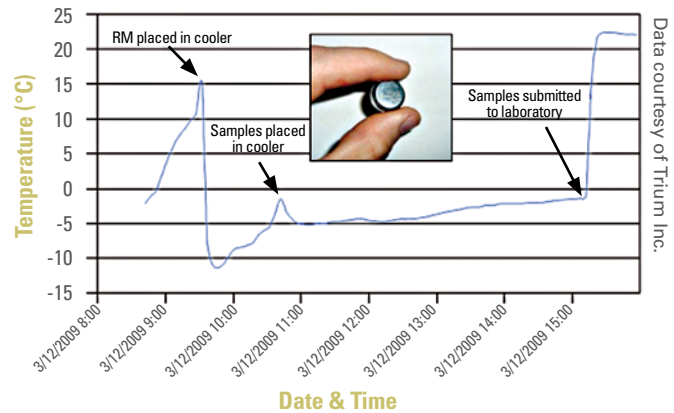
**President & Chief Executive Officer
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Documenting Temperature Control with Thermochrons

With the warm weather approaching, it's important to remember to add sufficient cooling media to your coolers when shipping or storing samples after collection. Some parameters are very sensitive to temperature fluctuations and regulatory bodies and consultants are beginning to recognize the importance of sample integrity before accepting data. For sensitive, legal projects or to just to raise the bar on quality for your sample protocols, we suggest a very simple, yet effective tool to monitor the storage conditions of your samples post collection.

Thermochrons are temperature-recording devices that start and stop taking temperatures of the cooler at regular time intervals. If microbiological samples are received at the lab at 18°C versus the



recommended 10°C, it begs the question “how long were samples at elevated temperatures?” Thermochrons can answer this question and help support a decision to go ahead with testing. It also can validate the temperatures recorded by the lab by IR guns.

This simple, inexpensive device can provide defensible data that documents the storage conditions over time. The graph gives an example of a thermochron plot that shows the temperature over time (in this case hourly). You can see the spike in temperature when the cooler was opened and closed. Thermochrons are returned to our customers when we receive the coolers so the data can be retrieved. The approximate cost for this device is \$50; it's a small thing you can do to invest in quality. **E**

Reminder: Chains of Custody

Maxxam Analytics is encouraging our customers to request customized Chain of Custody documents for their projects. These documents can include as much detail as required. Information such as reporting address, invoicing address, project number, quote number and PO number can be completed. The specific analyses required for your project will be provided instead of

Maxxam's default list. Reporting limits, pricing, and parameters, which are requested at the start of your project, will also be included. Customized Chain of Custody documents have proven to be an effective means of communication between project manager, field technician and Maxxam staff. Bottle kits, pre-labelled bottles and customized Chains of Custody can be requested from your project manager. **E**

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produced when chemical inhibition is used is reported as Carbonaceous BOD (CBOD). When nitrification is not inhibited, results are reported as BOD.

Although the BOD reaction takes approximately 20 days to reach completion, the greatest percentage of demand is exerted during the initial five days. The method consists of completely filling an airtight bottle with sample, nutrients and seeded dilution water prior to incubating the contents at 20°C for five days. The dissolved oxygen values for the samples are measured before and after incubation. The difference between the two values may be expressed as the biochemical oxygen demand.

Scope of Method

This method is routinely used to monitor water, sewage, industrial waste, and municipal wastewaters. Oxygen demand data is also used to measure biodegradable waste inputs to treatment plants and to evaluate the efficiency of such treatment systems.

This method is applicable for the determination of BOD in aqueous matrices. With the use of nitrogen inhibitor, this method is applicable for the determination of CBOD in aqueous matrices.

This method is also applicable to the analysis of soluble BOD and soluble CBOD following appropriate sample pre-treatment.

Reference Method


APHA 5210 B – Biochemical Oxygen Demand, Standard Methods for the Examination of Water and Wastewater, 21st Edition, 2005

Automation

With the introduction of the Skalar SP50 Robotic Analyzer, a significant part of this very labour-intensive analysis is now automated. The analysts must still prepare calibration solutions, QC samples and serial dilutions of client samples, but once the samples are placed in trays, the robot takes over. It is essentially a very large X-Y-Z autosampler equipped with two dissolved oxygen probes, and is able to collect data from two samples simultaneously. The bed of the robot has a capacity of three trays containing thirty-two bottles each. As trays are read, they can be removed and incubated, and replaced with others to be processed.

In normal operation, while the robot is processing the first trays, the analysts will be free to continue preparing additional trays of samples. Since a typical BOD run will be made up of hundreds of bottles, the ability to read samples while preparing additional ones results in a significant improvement in efficiency.

Once the samples are placed on the robot, all aspects of data collection, calculation and reporting are computerized, virtually eliminating transcription and calculation errors and saving the time formerly required to enter the data manually. The job of data validation (which usually falls to the section supervisor) can be focused more toward data quality rather than searching for errors in data transcription.

The SP50 Robotic Analyzer has quickly become an integral part of the BOD analysis at Maxxam Bedford. 

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