Solutions for Drilling Mud and Drilling Fluid Toxicity Testing

Numerous field studies show that drilling muds can contain elevated levels of toxic chemicals. Quickly evaluating the toxicity levels of these muds is becoming critical due to increased regulatory pressure.

Modern Water's Microtox® technology has been used extensively by drilling companies and their suppliers to test the toxicity of drilling muds and fluids. The innovative technology based on bioluminescence offers rapid toxicity screening and analysis. The test provides extremely accurate results and has been tested on over 2700 chemicals.

Modern Water's Microtox technology assists drillers and their key suppliers in three areas.

- **Regulatory Compliance** – Microtox technology has a proven track record of assisting drillers in compliance with local regulations regarding the disposal of drilling fluids including Canadian Waste Management Directive 50.
- **Improved Operational Efficiency** – leading oil well completion companies have incorporated Microtox technology into their drilling muds management programs.
- **Development of more environmentally friendly drilling fluids**

Laboratory and Portable Toxicity Testing Options

Modern Water offers two products that leverage its Microtox technology. The Microtox LX Series is a benchtop analyzer designed for laboratories and the Microtox FX Series, a lightweight portable analyzer for field testing.

Laboratory – LX Series

Key Features:

- Test sensitive to more than 2,700 different simple and complex chemicals
- Optional onboard color correction adjusts test results based on the sample's color and turbidity
- Results available in as little as 15 minutes*
- Cost effective and easy to perform tests
- Results provided as either EC values or % inhibition
- Excellent correlation with whole-organism toxicity test LD values
- Test results highly correlated with other widely accepted toxicity test methods
- On-board temperature control
- Built-in ISO and ASTM certified protocols
- Manufactured in a certified ISO 13485 quality system with 100% lot traceability

Field Portable – FX Series

Key Features:

- Biological early warning system sensitive to over 2,700 different chemicals
- Fast - Reliable results available in 5 minutes after initial sample preparation
- Fully portable - lightweight with sturdy field carrying case
- Battery life of up to 8 - 10 hours with typical use
- Compatible with widely available ATP test kits**
- Excellent correlation with HPC test methods
- Manufactured in a certified ISO 13485 quality system with 100% lot traceability

*After initial reagent preparation

**Check with your Modern Water monitoring representative to confirm compatibility with a specific test kit.

A Successful Drilling Muds Program

An effective drilling muds management program emphasizes

- Optimizing the use of drilling mud and water used
- Minimizing the amount of spent mud through recycling
- Reducing the toxicity of drilling water
- And segregating the dumping of wastes having different toxicity

How microtox technology delivers rapid, highly accurate results

Microtox® rapid toxicity detection is an in vitro test system that uses proprietary bioluminescent bacteria, *Aliivibrio fischeri*, for the detection of toxicity in water and is used as a screening system to detect the relative toxicity of a sample.

Bioluminescence is the production and emission of light by a living organism.

Bioluminescence occurs widely in marine vertebrates and invertebrates, as well as in some fungi, bacteria and terrestrial invertebrates such as fireflies. It occurs through a chemical reaction that produces light energy within an organism's body. For a reaction to occur, a species must contain luciferin, a molecule that upon reaction with oxygen, produces light.

Biosensor tests using bioluminescent bacteria have been in use for 30 years and their capability in detecting toxic substances is well understood. They use the principle that certain strains of bacteria emit light when healthy. When they are exposed to toxic substances, the amount of light emitted reduces. The greater the toxicity of the sample, the lower the light emitted. Measuring changes in light between healthy bacteria and bacteria exposed to toxic substances will therefore indicate the presence of a toxin in a water sample.

About Modern Water Monitoring

Modern Water is a specialty water monitoring business focused on acute toxicity testing and trace metal detection. Modern Water serves the oil and gas industry with advanced water quality monitoring and specialty immunoassay detection products engineered for reliability and cost-effectiveness. Our range of products assists companies in adhering to regulatory compliance issues, improve operational efficiencies and reduce costs. Modern Water's team of application specialists and regional testing laboratories provide local technical support.

To find out how we can help you please contact us on:

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