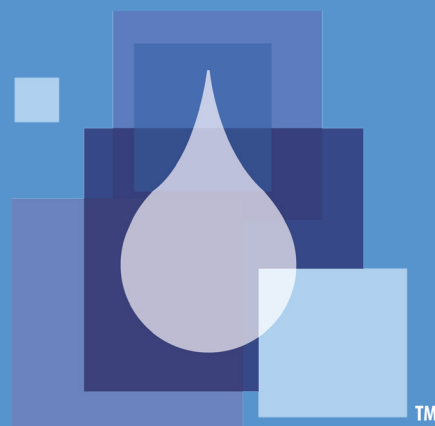


REFINERY APPLICATIONS



OndaVia

Definitive results. Decisive actions.

The OndaVia Story

OndaVia was founded in 2009 with a mission of making laboratory-grade chemical analysis fast and easy. Our early work focused on environmental applications, leveraging research grants and government funding to build our early products. This work formed the basis for the industrial process control test methods we provide today.



As we approach our tenth year, we continue help our customers world-wide perform measurements in complex samples across industries as diverse as oil & gas, food & beverage, environmental, and drinking water.

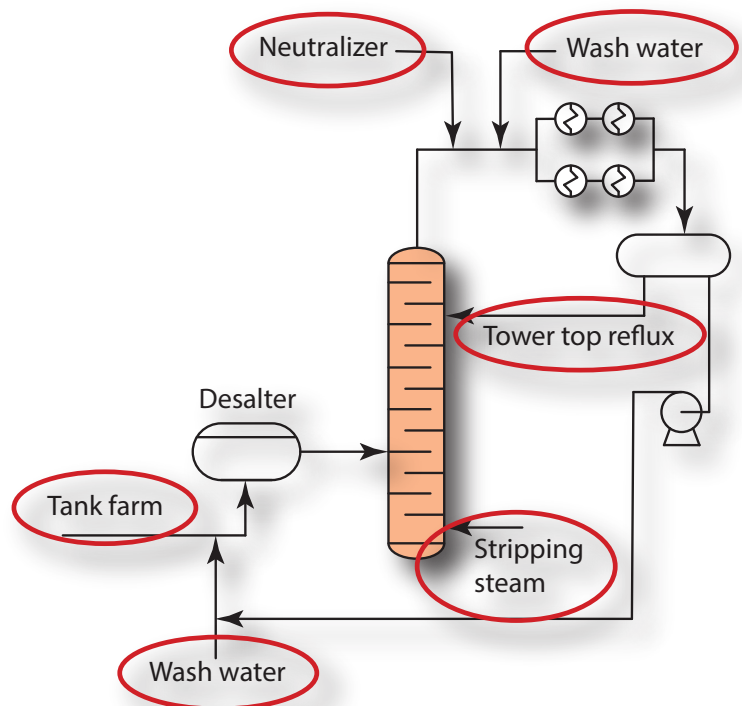
Our unique, powerful products measure contaminants in the most complex sample matrices. When you need to optimize a process, protect as asset, or make a decision about material quality, time counts. Why wait for the lab? Get the definitive results you need to take decisive action.

This document provides an overview of applications, but our system can do much more. If you have a specific need, just ask.

Amines in refinery process water

Amines arrive at the refinery from multiple sources. Tramp amines are present in the crude as remnants of upstream hydrogen sulfide scavenging, and can be especially problematic for refineries handling heavy, sour crudes. These residual materials affect the refining process, become heat-stable salts that form corrosive deposits. Amines are also used for corrosion control, both upstream and within the refinery, leading to additional amine content from contamination and unit leakage.

The refinery is further challenged due to water recycling within the refinery. Under acidic conditions, the amines partition into desalter water. If the pH at the desalter rises, the amines transfer back to the crude, working their way into downstream processes like the crude overhead. The reuse of water throughout the refinery can increase the amine concentration with each cycle, amplifying the problem.



MEA

MDEA

DMEA

DEA

Ammonia

Morpholine

Case Study

A refiner in the US Upper Midwest contacted us about measuring monoethanolamine (MEA) in their overhead water. Their crude slate consists primarily of heavy, sour Canadian crude that has treated with triazine-based H₂S scavengers upstream. The presence of MEA in the crude requires the crude tower to operate at a higher temperature to avoid salt formation and deposition. By monitoring the amine levels, the refiner is able to reduce their tower temperatures and to continue safely processing lower cost crudes. The total savings are estimated at a few million dollars per year.

Amines in refinery wastewater

The desalter is a major source of refinery wastewater. As amines are washed from the crude, they appear in the wastewater stream. Leakage from upstream processes like an amine unit can also contribute significant amine content to the wastewater treatment plant. Compounds like monoethanolamine, methylamine, dimethylethanolamine, and methyldiethanolamine all appear at the wastewater plant. These amines, in turn, lead to nitrification of the wastewater treatment system, upsetting system performance.



Case Study

A Gulf Coast refinery approached OndaVia about measuring methyldiethanolamine (MDEA) in their wastewater samples. A process upset led to unusually high levels of MDEA in the wastewater, causing failures in the treatment system. The laboratory was inundated with analysis requests, running up to fifty samples per day and straining the capabilities of the ion chromatography system. A project was designed to reduce strain on the laboratory by moving amine testing to the process unit engineering team; however, as the project commenced, the laboratory realized they could perform testing for a full suite of amines traditionally measured via ion chromatograph. OndaVia delivered a custom test kit to measure three amines in one sample preparation, allowing the laboratory to focus on product quality control testing.

Crude oil analysis

Amines are problematic in the refining process, but with proper monitoring and control, high amine crudes can offer the refiner an opportunity for extra margin. An important step in this decision is measuring the amine content of the crude itself. Most crudes contain under 10-ppm of a typical tramp amine, but the level in the desalter can quickly rise. If the crude source is changed frequently, it is essential to measure the amine content at the source versus after processing is well underway.

Much like the presence of amines in refinery wastewater, the presence of methanol affects the treatment process. Methanol poisons the system, upsetting the balance necessary to keep the treatment process working effectively. Also similarly to amines, methanol arrives in the crude from upstream processing and transitions readily into the aqueous phase.

Our sample preparation methods open the door to the application of many OndaVia methods to crude oil testing.

Applications include:

- Tramp amines
- Methanol
- Sulfur (total)
- Hydrogen sulfide
- Vanadium



Definitive results. Decisive actions.



Headquarters

OndaVia, Inc.
26102 Eden Landing Rd. Suite 1
Hayward, CA, 94545
+1-510-576-0476

European Office

OndaVia B.V.
Marconistraat 16
Rotterdam
NETHERLANDS

Online

Web: www.ondavia.com
Twitter: @ondaviainc
Email: info@ondavia.com