



INDUSTRY
Specialty
Chemicals



PROCESS TYPE
Batch
Processing



ANALYTICS TYPE
Process
Analytics

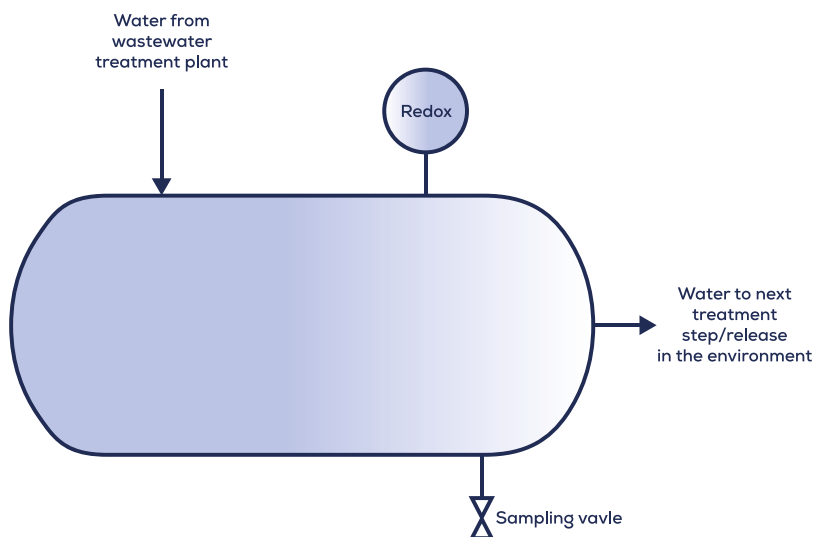


KEY OBJECTIVE
Improve
Wastewater Quality

Correlating Wastewater Quality with Live Process Data

BACKGROUND

A chemical company in the Netherlands that produces corrugated cardboard wanted to review the correlation between various processes and wastewater parameters. The company especially was interested in learning about how the influence of organic acids, particularly n-butyric acid, affects wastewater quality.



CHALLENGE

To ensure the wastewater meets acceptable quality, the company must monitor the concentration of unwanted substances. Because online concentration measurements can be expensive, difficult, or even impossible, the company relied on lab analysis. This approach is time-consuming and can lead to a delay of several days before process experts can see the results. By the time they receive the lab analysis, it could be too late to improve operational performance.

SOLUTION

- Create tags in TrendMiner using the lab data
- Identify correlations between wastewater quality and live process parameters, especially n-butyric acids
- Determine if a correlation exists between different wastewater quality parameters and the redox value

Challenges

Wastewater quality lab results were not available in the company's historian.

Approach

- Add the lab data into TrendMiner and create tags to compare it to live data
- Use the influence factor functionality in TrendMiner to find influences for the organic acid concentrations
- Use the time shift function to search for optimal correlation
- Determine if the company can use the redox value to measure the acid concentration in the wastewater

RESULT

- Process experts easily could see that there was a correlation between the redox value and the n-butyric acid concentration five days later
- They also found a strong correlation between the redox value and other organic acids
- In the future, the redox value can be used to conclude the acid concentration and thus intervene in the process in time

TRENDMINER FEATURES USED



COMPARE TABLE

TrendMiner helps to discover tags with significantly different values by comparing layers or time periods. Comparing statistical data distributions and evolutions is beneficial in finding performance anomalies. The value of each tag per layer is shown as columns in a resulting table, and the value of each tag in comparison to the reference layer is shown as rows in the same table.



INFLUENCE FACTORS & TIME SHIFT

TrendMiner helps find influence factors to discover the root cause of process anomalies. In some cases, the influencing factor may lay hours upstream in the process. With the use of an automatic time shift detection, the most likely influence factor can be found – even if it took place long before the tag was impacted.



TAG BUILDER

TrendMiner's tag builder allows the creation of time series data through the use of formulas on and aggregations of the tags. The results of these tags can be visualized just like any other tag. The tag builder can also be used for importing time series data via a CSV file.



CAPTURE EVENTS OF INTEREST

Specific occurrences can be captured as events and labeled automatically, based on monitoring alerts for saved search patterns, fingerprints, and rules. The captured events can be used to monitor how often these events happen and even to prevent and control overall production performance.

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