

## APPLICATION NOTE

### Caustic in Water Using a ClearView® db Photometer

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#### Purpose

To measure NaOH concentration in water online with our GUIDED WAVE™ ClearView® db Dual-Beam Photometer and a fiber optic flow cell in a slip stream.

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#### Measurement Background

Water is an intense absorber in the NIR, requiring small optical paths to make useful measurements. These small paths may plug or entrain bubbles. The spectral signals in aqueous systems also change considerably with temperature. Process Insights has selected one wavelength at 1290 nm for calibration of NaOH that best addresses these issues. The absorbance at this wavelength does not change drastically with temperature and it allows a 1 cm optical path to be used in the fiber optic probe. Several reference wavelengths can be used (at lower wavelengths) for this measurement. For optimal performance it is advisable to heat trace a slip stream to minimize temperature fluctuations if possible.

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#### Results

The resulting data is for samples ranging from 5-20% NaOH at 30 °C. The sample containing 10% NaOH was also analyzed at both 25 and 35 °C. The resulting calibration is linear, as shown in Figure 1, with an average error of 0.35%.

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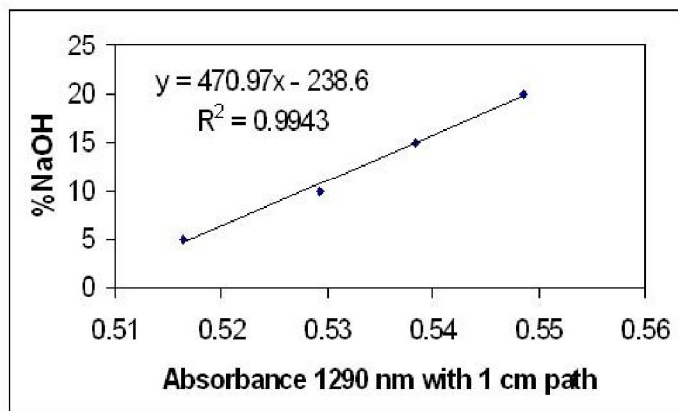


Figure 1

Abs @ 1290 nm	% NaOH	Temperature °C	Predicted	Residual	Average Error
0.51638	5	30	5.60	0.40	0.35
0.52933	10	30	10.70	-0.70	
0.53832	15	30	14.93	0.07	
0.54857	20	30	19.76	0.24	
0.52816	10	35	10.15	-0.15	
0.52805	10	25	10.10	-0.10	

## Conclusions

These results demonstrate that a ClearView db photometer system with a fiber optic probe can measure caustic concentration on-line with a continuous 4-20 mA output to a DCS. Visit the Process Insights website for more information on our analytical systems and probes.

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