

Application Note:

Caustic in Water with a ClearView® db Filter Photometer

Purpose:

To measure NaOH concentration in water on-line with the ClearView® db filter photometer and a fiber optic flow cell in a slip stream.

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. Guided Wave 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.

Results:

The resulting data (shown at right) 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%.

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.

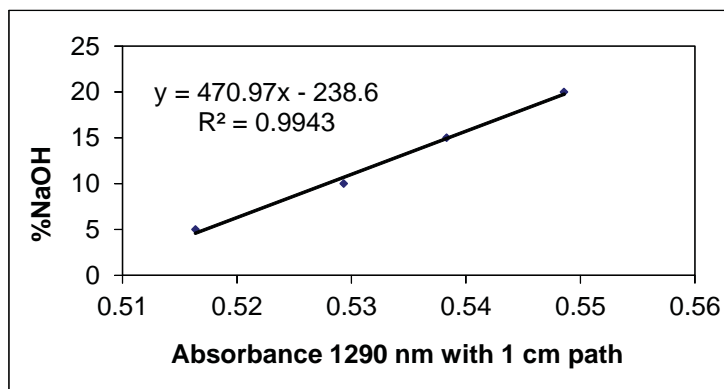


Figure 1

Abs @ 1290 nm	% NaOH	Temp. °C	Predicted	Residual	Absolute Residual
0.51638	5	30	4.60	0.40	0.40
0.52933	10	30	10.70	-0.70	0.70
0.53832	15	30	14.93	0.07	0.07
0.54857	20	30	19.76	0.24	0.24
				AVERAGE ERROR:	0.35
0.52816	10	35	10.15	-0.15	0.15
0.52805	10	25	10.10	-0.10	0.10



ClearView db ExProof Unit



PFA PEEK Flow Cell