

## Application Note — Caustic in Water with a ClearView® Filter Photometer System

### Purpose:

To measure NaOH concentration in water on-line with the no-moving parts ClearView® filter photometer and a fiber optic flow probe for a slip stream.

### Approach:

There are several ways to analyze a mostly aqueous stream. Water is an intense absorber in the NIR, requiring small optical paths, which may plug or entrain bubbles. The spectral signals also change considerably with temperature. We have selected one wavelength at 1290 nm for calibration of NaOH that best addresses these issues. It does not change significantly 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). It is still advisable to heat trace a slip stream to minimize temperature fluctuations for optimal performance.

### Results:

The resulting data are shown below for samples from 5-20% NaOH at 30 °C. The sample containing 10% NaOH was also analyzed in Optical Solutions' HeaterCell™ fiber optic accessory at 25 and 35 °C. The resulting calibration is linear, as shown below, with an average error of 0.35%.

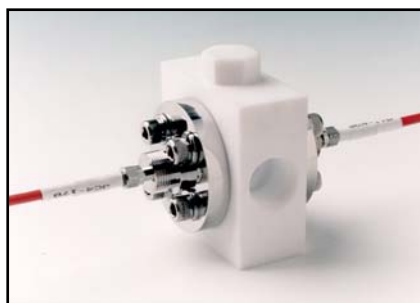
### Conclusion:

These results suggest that a no-moving-parts ClearView® photometer system with a fiber optic probe can measure caustic concentration on-line with a continuous 4-20 mA output to your DCS with the intrinsic safety of optical fibers.

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®  
Class 1, Div 1



Teflon Fiber Optic Flow Probe

