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## Application Note:

# On-Line Monitoring of Ethylene: Diethylene Glycols with a ClearView® db Photometer

**Purpose:** Continuous measurement of ethylene glycol in diethylene glycol using a near-infrared (NIR) ClearView db fiber optic filter photometer.

**Experimental:** A diode array spectrometer was used to measure the NIR spectra of ethylene:diethylene glycol (EG:DEG) mixtures. Low-OH fiber optic cables were used and the samples were measured in a 10 mm glass cuvette at room temperature. To test the viability of a photometer for the real time monitoring of ethylene glycol in diethylene glycol the data was processed using a Multiple Linear Regression (MLR).

**Results:** The resulting spectra are shown in Figure 1 for 0, 2, 20, 40, 60, 80, 98 and 100 wt% EG in DEG. Our analysis indicated that 1226 nm (shown by the vertical line) provided the best single wavelength solution for the ClearView db process photometer. This is the 2nd C-H overtone region, which shows the different C-H vibrational character of the two compounds. It was chosen outside the water regions to minimize interferences. Excellent linearity is achieved, as shown in the observed vs. predicted EG plot in Figure 2. A standard error for the regression of 0.46% EG was achieved for the 10 mm optical path. On-line precision is expected to be comparable to a process GC.

**Conclusions:** The ClearView db can match the typical1% FS performance of a process GC at about 2/3 the price with lower maintenance costs. Compared to a GC, ClearView db's data update is virtually continuous. With its small size, its installation costs are half of typical GC installation costs. The only maintenance required is changing the lamp every 4-6 months, and a periodic probe cleaning.

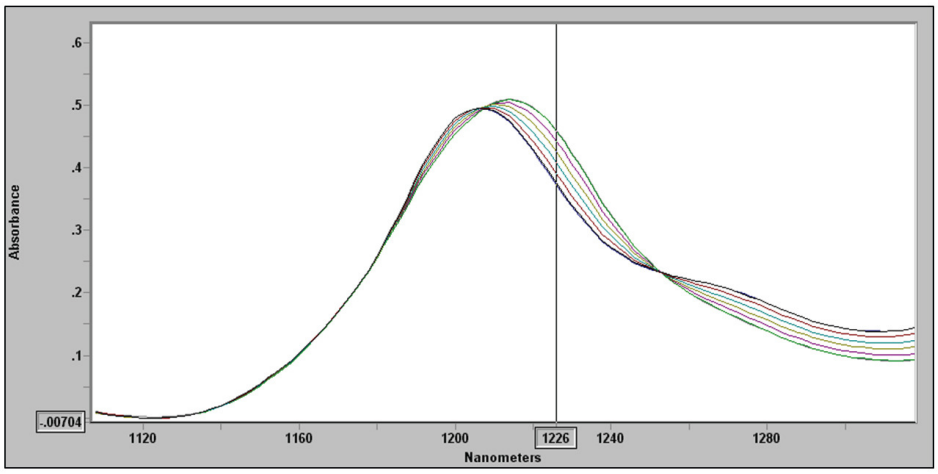


Figure 1

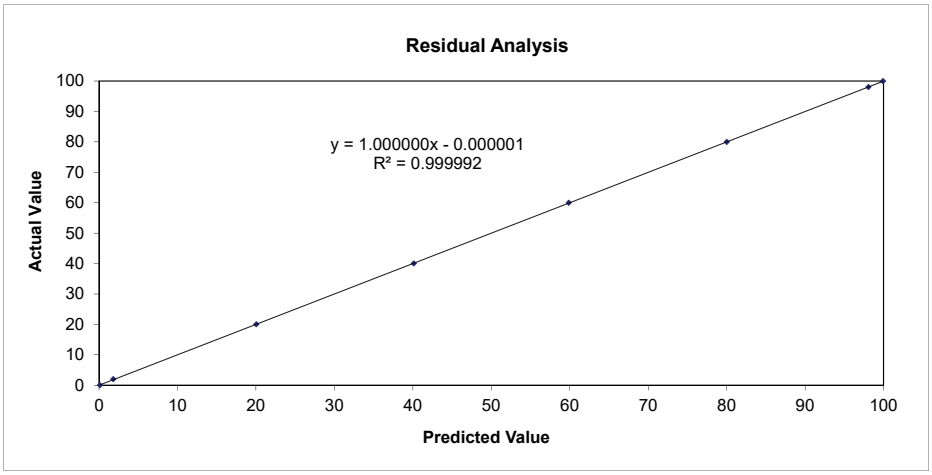


Figure 2

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