

## APPLICATION NOTE

### Monitoring Reverse Phase LC of Acetonitrile / Water in Pharma Applications

#### Purpose

To provide continuous monitoring of acetonitrile (ACN):water mobile phase gradients utilized in prep scale reverse phase chromatographic separation of active pharmaceutical ingredients with a GUIDED WAVE™ ClearView® db Dual-Beam fiber optic filter photometer.

#### Experimental

A spectrometer was used to measure the NIR spectra of ACN:water mixtures to select wavelengths for our process photometer. Two meters of low-OH fiber optic cables were used and the samples were measured in a 10 mm quartz cuvette at 40 and 50 °C.

#### Results

The resulting spectra are shown in Figure 1 for 10, 20, 30, 40 and 50 wt. % water in ACN. The main water peak near 1420 nm is off-scale for the 10 mm optical path selected. The alternative would be to use a 1 or 2 mm optical path to keep this peak on scale. The slightly different curves at each concentration reflect the effect of sample temperature on the water spectrum.

Two wavelengths were selected for calibration. The calibration model also includes a coefficient for sample temperature. The predicted vs. actual plot (Figure 2) shows an excellent calibration with an  $R^2$  of 0.9997 and a standard error of 0.3% water. The temperature coefficient indicates a correction of 0.15% water per °C. The ClearView db's long-term drift of <500  $\mu$ AU thus gives excellent precision.

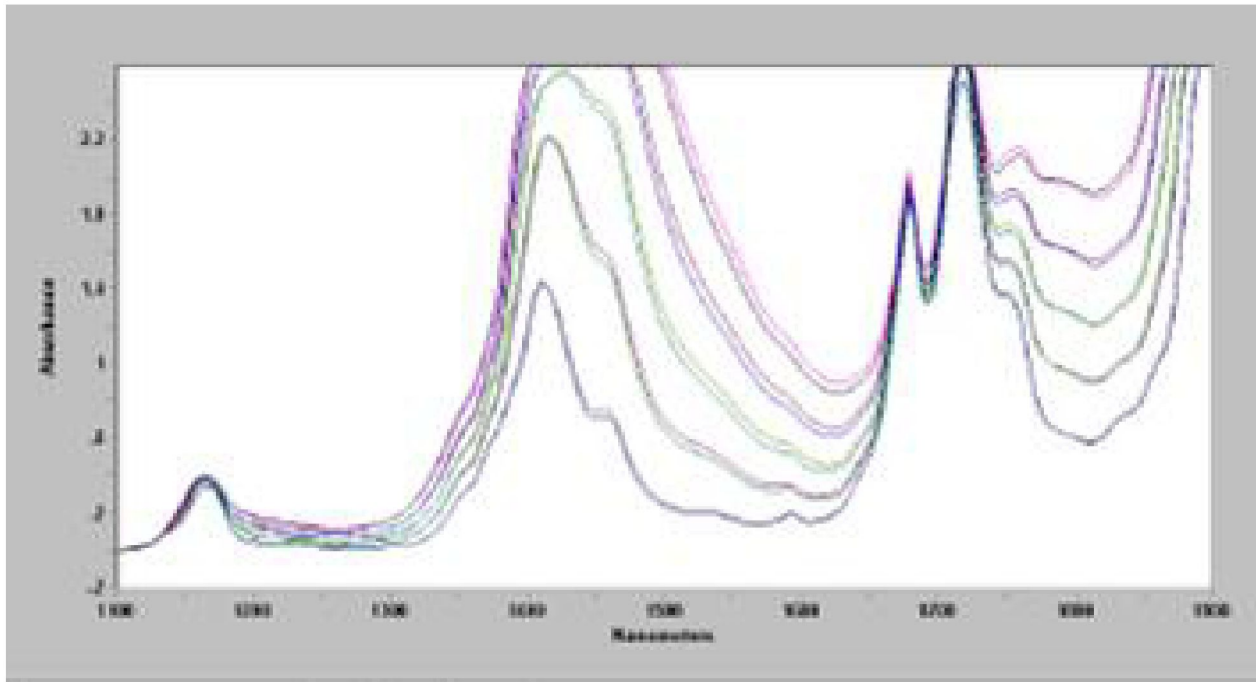


Figure 1

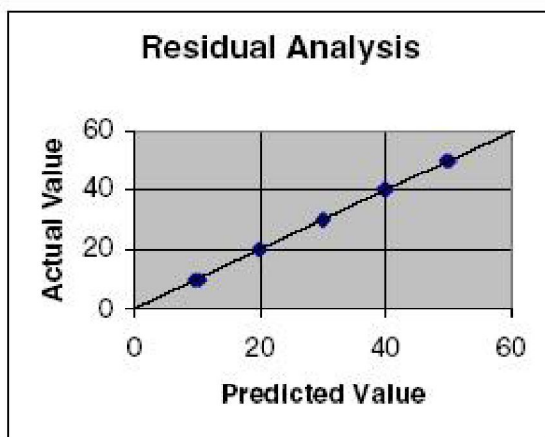


Figure 2

## Conclusion

Our ClearView db photometer can readily make this measurement using direct insertion fiber optic probes or flow cells for bypass streams. Our ClearView db photometer can measure two independent fiber optic probes at the same time decreasing the overall cost per sample point. Contact a Process Insights sales or technical representative for more information on the analyzer or application.

## GAIN REAL-TIME INSIGHT INTO YOUR PROCESS

Process Insights manufactures and delivers premium sensors, monitors, detectors, analyzers, instrumentation, and software that are mission-critical to keep your operations, personnel, and the environment safe – every day across the globe.

Get the most reliable, precision analytical technologies available on the market today. We will work to match your needs and budget, and provide the optimal, and most stable process analysis solution for your application.

---

## CENTERS OF EXCELLENCE | PROVIDING PROVEN SOLUTIONS

Process Insights is committed to solving our customers' most complex analytical, process, and measurement challenges everyday.

### Process Insights – The Americas

4140 World Houston Parkway Suite 180, Houston, TX 77032, USA +1 713 947 9591

### Process Insights – EMEA

ATRICOM, Lyoner Strasse 15, 60528 Frankfurt, Germany +49 69 20436910

### Process Insights – APAC

Wujiang Economic and Technology, Development Zone, No. 258 Yi He Road, 215200 Suzhou, Jiangsu Province, China +86 400 086 0106

---

For a complete range of products, applications, systems, and service options, please contact us at: [info@process-insights.com](mailto:info@process-insights.com)

For a complete list of sales & manufacturing sites, please visit:  
<https://www.process-insights.com/about-us/locations/>

COSA Xentaur, Tiger Optics, Extrel, Alpha Omega Instruments, ATOM Instrument, MBW Calibration, MGA, Guided Wave, ANALECT and LAR TOC Leader are trademarks of Process Insights, Inc.



REVOLUTIONIZING MEASUREMENT

**EVERYWHERE**