

APPLICATION NOTE

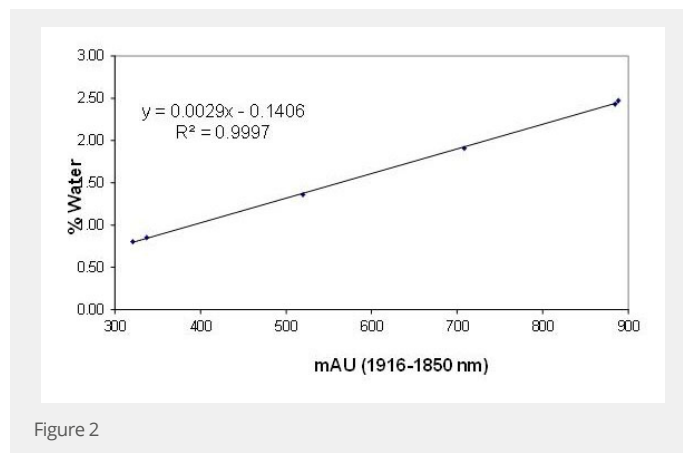
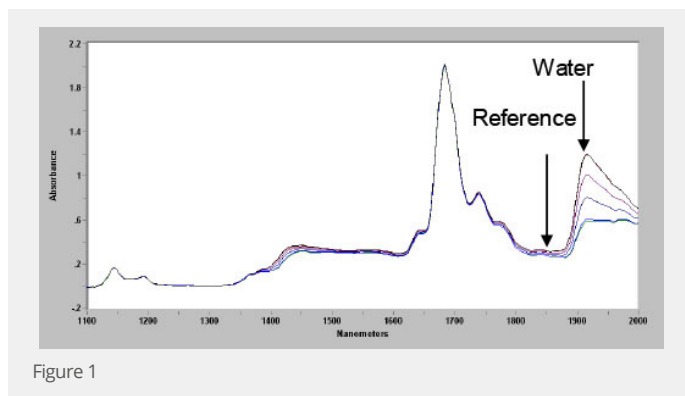
Water in Aromatic/Acetone Mixtures with a ClearView db Photometer

Objective

Measure water to better than $\pm 0.01\%$ (wt.) in an aromatic liquid mixture with a ClearView® db photometer.

Experimental

Samples were measured in a 5 mm cuvette heated to 47 °C. Spectra was then collected of the samples using a LAB NIR-O™ spectrometer. Water concentrations were determined by KF titration. Samples contain isopropyl benzene, acetone and phenol in approximately constant ratios.



Results

C-H activity occurs in the 1700-1800 and 1100-1200 nm regions. The strong peaks at about 1690 and 1150 nm are due to aromatic C-H. Water occurs in two regions at 1430 nm, and more strongly at 1916 nm.

A photometer operates by analyzing differential absorbance between a reference wavelength and the peak water wavelength. In this case, a reference wavelength near the 1916 nm water peak is chosen at 1850 nm.

The absorbances for all samples were determined from these spectra and plotted against water content. See Figure 2. The resulting linear regression is excellent. The slope of the regression shows 0.003%water/mAU. The long-term drift of our ClearView db photometer is <500 μ AU. We expect the precision of this on-line analysis to be excellent.

It is important to minimize sample temperature fluctuations and the presence of particulates to achieve the stated precision. ClearView db can be equipped with an RTD temperature sensor for automatic temperature compensation. Thus, we can run your samples at several temperatures in a final calibration before shipping the analyzer. The resulting calibration would have coefficients for both absorbance and temperature.

Conclusions

Our ClearView db photometer can measure water in complex mixtures to better than $\pm 0.01\%$ (wt.). It can utilize up to 2 fiber optic insertion probes flanged directly into a reactor or column, or flow cells on a slip stream for even better cost per sample point.

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

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