

APPLICATION NOTE

Online Monitoring of Water in Acetic Acid Using a ClearView® db Photometer

Purpose

To determine water content in acetic acid with sample temperature correction.

Approach

A full spectrum NIR spectrometer was used to measure the spectra of 0-15% water in acetic acid at various temperatures in a 5 mm cuvette cell.

Results

The resulting spectra are shown in Figure 1. Minimum temperature sensitivity is found at 1420 nm. (vertical line). Excellent linearity is achieved (see Figure 2) in the range tested, up to 15% water. Our GUIDED WAVE™ ClearView® db Photometer is able to measure water in acetic acid to better than 0.1% under isothermal conditions.

The absorbance of water is known to change as a function of temperature, and this will change the reported water content. This relationship is shown in the graph in Figure 3. Changing the temperature by 5 °C from the target temperature of 50 °C changes the absorbance by about 0.010, or 10 mAU. From the above calibration, this means a change in the reported water value by 0.15%, or about 0.03%/°C. By measuring the sample temperature with an RTD element, bringing the signal back into the ClearView db (through an intrinsic safety barrier for hazardous environments), and including a temperature coefficient in the ClearView db, a precision of 0.05-0.1% water in acetic acid can be achieved.

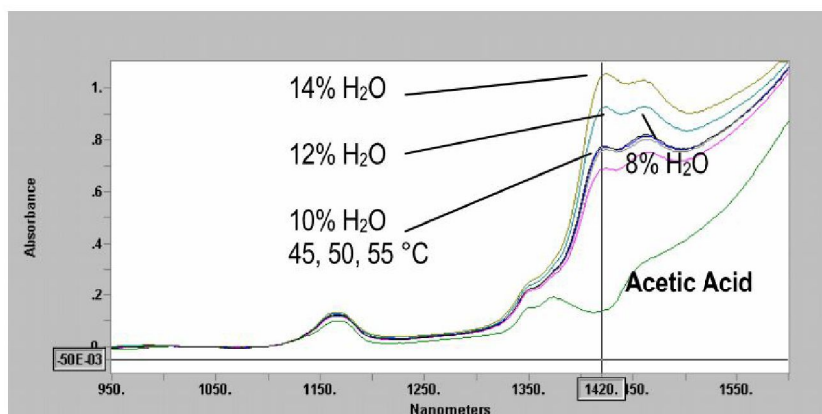


Figure 1

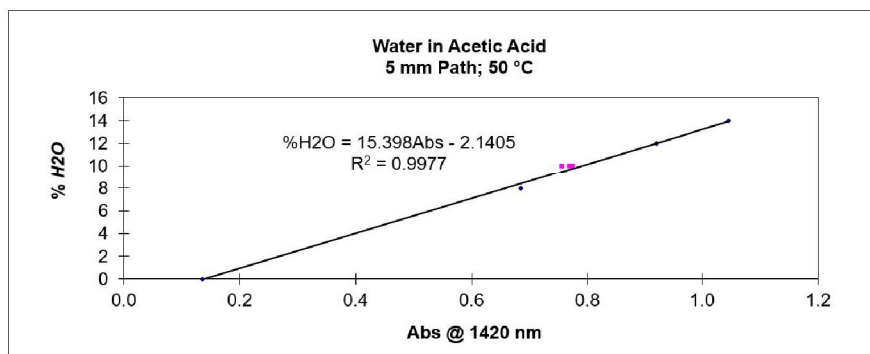


Figure 2

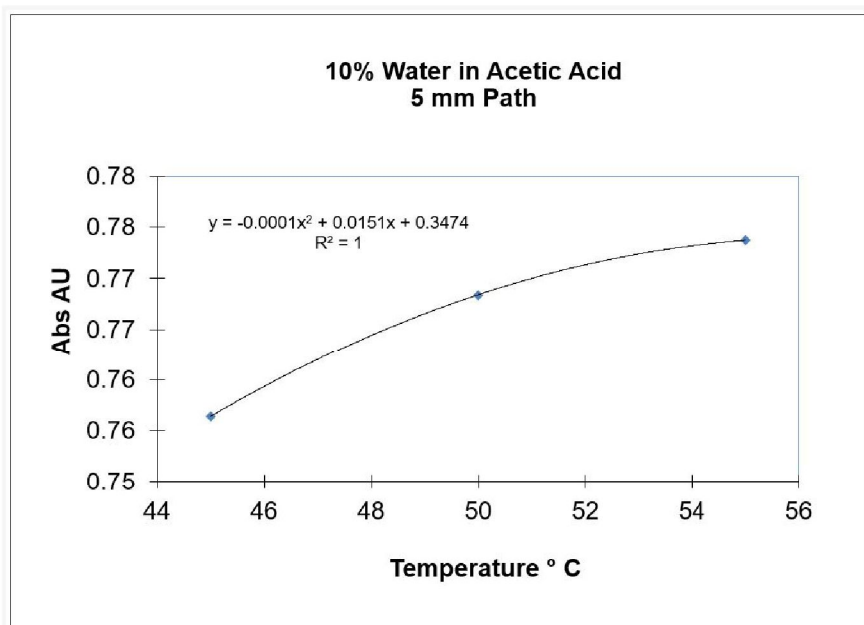


Figure 3

Conclusion

Our ClearView db Photometer with sample temperature correction can achieve 0.1% precision for the measurement of water in acetic acid on-line. Visit the [Process Insights website](#) for more information on this analyzer and related applications.

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