

Application Note — On-Line Monitoring & Product Release of APHA Color with a ClearView™ Photometer

Purpose:

To determine APHA color on-line for process control or in the lab for product release.

Approach:

An Optical Solutions' PS-2-UV/VIS diode array spectrophotometer and HeaterCell™ fiber optic accessory were used to measure the visible spectra of the Pt-Co, APHA color standard in the range from 0 to 500 at room temperature in a 1 cm cuvette.

Results:

The resulting spectra are shown at top right. The Pt-Co standard has a peak near 455 nm. The calibration for these data is shown at middle right.

The 300 APHA sample was analyzed three times with excellent reproducibility. ClearView™ has a long-term stability of about 1 mAU. This means that in a 1 cm fiber optic probe or cuvette, the precision of the measurement is ± 3.5 APHA, or about 0.7% full-scale. Usually a 2 cm probe is used for measurements in the 50-500 range with a precision of ± 1.8 APHA.

In many cases, for materials such as polyols, ethylene oxide and others, product release requires APHA to be < 10 . The graph at right shows a calibration for such weakly colored liquids taken in a longer path (10 cm) flow probe that can be used on-line, or mounted in a stand and placed in a fume hood next to a less expensive ClearView™ photometer in a NEMA 4X enclosure outside the hood. The precision of the APHA color measurement is 0.5. Such a long path probe is shown at bottom right.

Conclusions:

ClearView™ can provide on-line and lab measurements with high precision for all APHA measurements. In the process, the Simulplex™ ClearView™ can measure two probes simultaneously. In the lab, the lower sample volumes, elimination of color matching tubes, rapid analysis without visual bias, and protection of workers from toxic materials using fiber optics make ClearView™ a clear choice for APHA color measurements.

