



Improved deep ultraviolet spectrum measurements

Chelmsford, MA, September 1, 2017 – *McPherson is pleased to announce:*

New digital flow controllers improve measurement accuracy in the specialized VUVAS ultraviolet spectrophotometer systems and improve lifetime of ultraviolet lamps at short wavelengths.

Ultraviolet photons are sufficiently energetic to break bonds and reorganize molecules. Making and measuring light below 200nm demands special experimental considerations, it presents unique challenges. For UV measurements from 120 to 200 nanometers fluoride refractive optics replace silica, and vacuum-absorbing components of air (oxygen, water vapor, carbon dioxide) must be removed from the experimental apparatus. The high energy that makes UV light interesting can cause problems for precise UV measurement systems. It causes photochemical formation of organic films on optical surfaces and degradation of performance.

Photochemical film formation is the result of organic contaminants photo polymerizing on optical surfaces. Even in ultra high vacuum systems, residual contamination exists – out gassing from chamber walls, samples, and perhaps the errant fingerprint. Over time, these films cause increasing and wavelength-dependent loss of performance. To control the growth of organic films in UV instruments, make UV measurements if possible under an inert gas atmosphere (typically nitrogen) rather than in vacuum. The advantage of a purged measurement systems long-term stability is apparent when examining time-dependence of transmission loss. Measurements under vacuum show a quasi-exponential, irreversible decay in transmission. Identical measurements under nitrogen purge show small random fluctuations about a mean value, with no overall long-term loss.

The newest VUVAS spectrophotometer systems can be equipped with integrated digital mass flow controls (MFC). They add patented, precise thermal sensing and flow rate control capability with set point accuracy. These can consistently improve measurement results. Photochemical deposition of organic films can be reduced or eliminated with inert gas purging. Digital control of the purge environment in UV optical systems like the McPherson VUVAS spectrophotometer, delivers more stable and reproducible results. We look forward to working with you to configure the best ultraviolet metrology system possible using purge or high vacuum. Call McPherson today to discuss your application.

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McPherson designs and manufactures scanning monochromators, flat field spectrographs, vacuum spectrometers and measurement systems for reflectance, transmittance, absorbance and more. It provides accessories like light sources, detectors, data acquisition software, sample chambers, telescopes and collimators. McPherson is a privately held corporation, founded in 1953 and based in Chelmsford, MA USA. For more information, visit www.mcphersoninc.com