

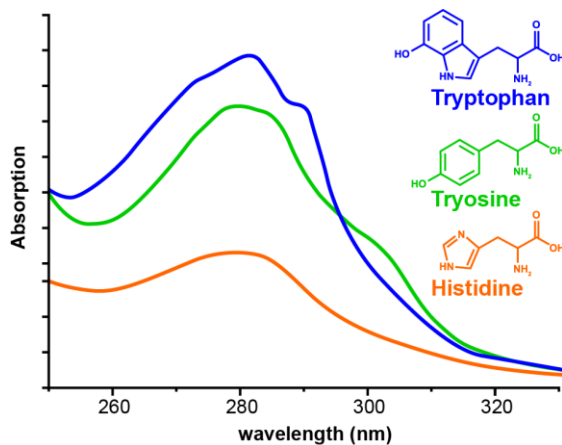
APPLICATION NOTE

3.01 PHARMACEUTICAL & BIOTECH

PROTEINS

- Strong UV absorbance
- Highly concentrated to trace detection
- Chromatography control
- Concentration monitoring
- Real time in-line measurement

Proteins are large biological molecules comprised of one or multiple amino acids. Proteins in solution absorb ultraviolet light with an absorbance maximum at 280nm. The primary reason for this is due to the aromatic amino acids, e.g. phenylalanine, tryptophan, tyrosine and histidine.

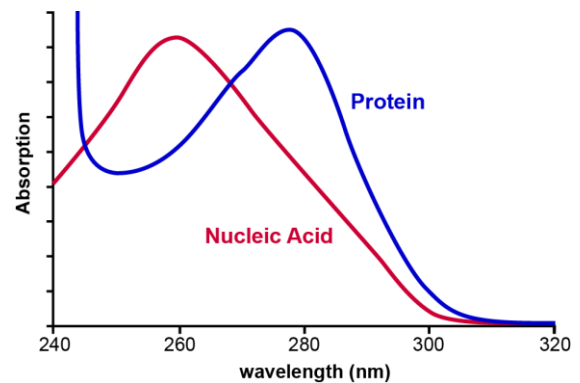


For post chromatography column detection, UV absorption is used to detect the onset and end of proteins as they elute the column, in addition to the total volume eluted from the column. Liquid buffer and solvent gradients in the mobile phase are utilized in order to elute the sample components from the chromatography column. UV absorption is the preferred technique as the mobile phase often has no absorption at 280nm allowing a precise control of the chromatographic separation irrespective of the continuous phase composition.



Kemtrak DCP007 industrial UV-VIS-NIR photometer with a DN50 TriClamp measurement cell

It is also possible to measure the purity of biomolecules by ratio of absorbance at 280nm and 260nm. The A_{260}/A_{280} ratio provides an indication of protein contamination in nucleic acid isolates and less commonly, nucleic acid contamination in protein isolates.



APPLICATION

A [Kemtrak DCP007-UV](#) LED photometer is the recommended instrument to accurately measure protein concentration.

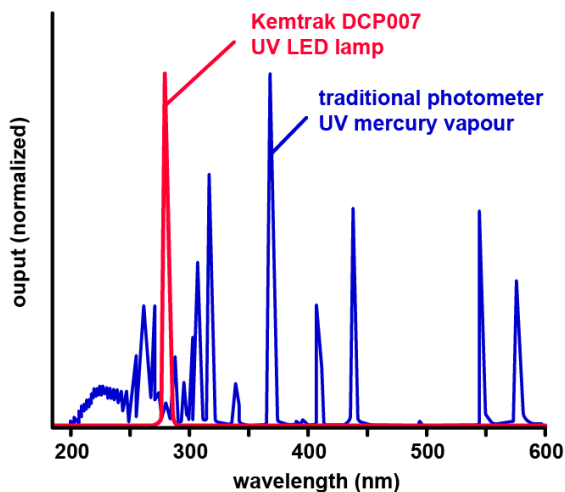
Traditional UV photometers use powerful mercury vapor UV lamps that subject the sample to broad spectrum UV radiation and heat generated by the lamp. The resulting light that has passed through the sample then passes through a UV filter and is detected by a photodiode. The hot broad-spectrum

UV radiation used on these traditional photometers destroys the sample being analyzed resulting in unknown and potentially hazardous breakdown products.

The [Kemtrak DCP007-UV](#) photometer uses a state of the art high performance UV LED light source and precision fiber optics. The sample is subjected to ultra-low power cold light of the exact wavelength required for the analysis, thousands of times less powerful than that used on traditional photometers. The Kemtrak UV LED light source is also modulated and can be configured to measure during very short pulses, further reducing the exposure of the sample to potentially harmful UV radiation.



Kemtrak zero dead volume TriClamp DIN10 316L hygienic measurement cell



INSTALLATION

Convenient zero dead-volume hygienic measurement cells contain no electronics or moving parts. Since optic fibers are used to transfer light to the measurement point and back, only ultra-low power cold light passes through the sample and the instrument is well suited for hazardous environments

It is simple to change the LED light source on the [Kemtrak DCP007-UV](#) photometer and the unit can easily be reconfigured to analyze at different wavelengths.

NIST-traceable validation filters are available to verify analyzer performance without process interruption.