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UV-vis instrument technology tips shared - Tech Information

The photometric range specified for a UV/Vis spectrophotometer does not mean that it is linear over that range. Not all instruments give their specifications for linear dynamic range, though they always give the photometric range.

An exciting technology that is becoming ever more commonplace in UV/Vis spectrophotometers is photodiode array technology, which is helping to increase the speed and robustness of the instruments, ultimately leading to enhanced throughput.

Typically, sample volumes are in the range of 0.5 to 2 µL. Some instruments feature fiber-optic probes for measuring samples outside the UV/Vis spectrophotometer's sample compartment. This enables analysis of the **sample in situ**, which is especially useful when it is not possible to physically remove samples, for example, when monitoring industrial production lines, blood or the environment. Another consideration is path length.

Microvolume spectrophotometers have a very short path length, normally between 0.1 to 1mm, which allows **highly concentrated samples to be analyzed without the need for dilution**.

A typical level of wavelength accuracy for UV/Vis instruments is around ±1nm, however, some instruments achieve accuracies of ±0.5nm.

Absolute photometric accuracy may not be critical and in most quantitation applications, as long as the measurements are reproducible and linear over the wavelength range, the photometric accuracy is not critical. However, **it does become a critical parameter when comparing the results over multiple instruments.**

- The wavelength of maximum absorption of analytes you wish to detect and quantify will determine the wavelength range you require from your spectrophotometer. Some instruments are specifically designed for **certain materials** and will have **wider application ranges.**
- If this is a regulated industry, the instrument and software will require certain security measures and advanced QC (Types of regulated industry: Drug and pharmaceutical, materials science, food & beverage, environmental analysis, and clinical diagnosis and medical research*. ***Medical research has been increasingly used UV/VIS Spec for non-invasive analysis of soft tissues.**

TOP 3 things to consider for UV/Vis instrument:

- Accommodation of your sample type and volume
- Compliance with industry rules and regulations

- Wavelength range

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