Double beam vs dual beam – does it really matter?

Technical Overview

Introduction

There is much debate over whether one requires access to both a sample beam and reference beam for performing UV-Vis measurements. In fact, a lot of this debate is stimulated by the providers of UV-Vis instrumentation. In reality, the only requirement in a scanning UV-Vis instrument that is essential is that the sample and reference beam is measured simultaneously so that any corrections for beam intensity fluctuations can be corrected.

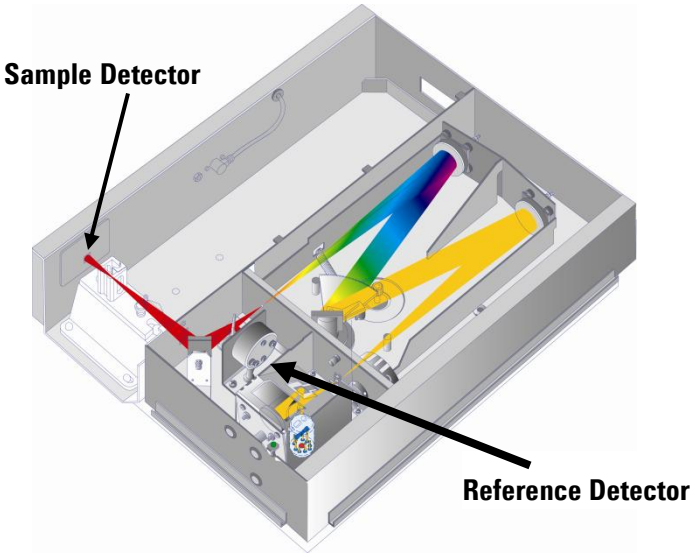

Figure 1. Ray trace diagram of Cary 60 showing Reference and Sample detectors

The way in which this is solved today is by having a double-beam instrument, in which a 'chopper' mechanism splits the beam in two – sample and reference – and measures the signal using one detector.

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Another way is to use a dual-beam instrument where, by design, a beam-splitter divides the beam into sample and reference and two detectors are used to measure the sample and reference signals. Dual-beam instruments can provide access to the reference beam, or the system can be simplified and provide only access to the sample beam, as with the Cary 60 and its predecessor, the Cary 50. Both designs still provide the same mechanism for correcting for fluctuations in beam intensity from reading to reading.

NOTE: While there are cases that access to the reference beam is required, these are rare in routine measurements and are only necessary where changes in solvent/blank are occurring over time.

The Cary 60 is revolutionary in its design. While having both a sample and reference detector – which is all that is required to perform accurate, baseline – corrected, double-beam like measurements – it 'hides' away the reference beam thereby removing significant constraints within the a sample compartment caused by having access to both beams. The data quality is uncompromised, the benefit of using unique accessories is leveraged, and the instrument can address virtually any routine UV-Vis measurement BETTER, FASTER and at a LOWER COST OF OWNERSHIP.

Conclusion

The Cary 60 can be used to measure baseline corrected spectra, obtaining data quality similar to, or better than, any double-beam instrument.

Although the instrument design between a double-beam or dual-beam instrument may differ, the result for routine measurements is the same.

Six simple steps to measuring baseline corrected data on the Cary 60

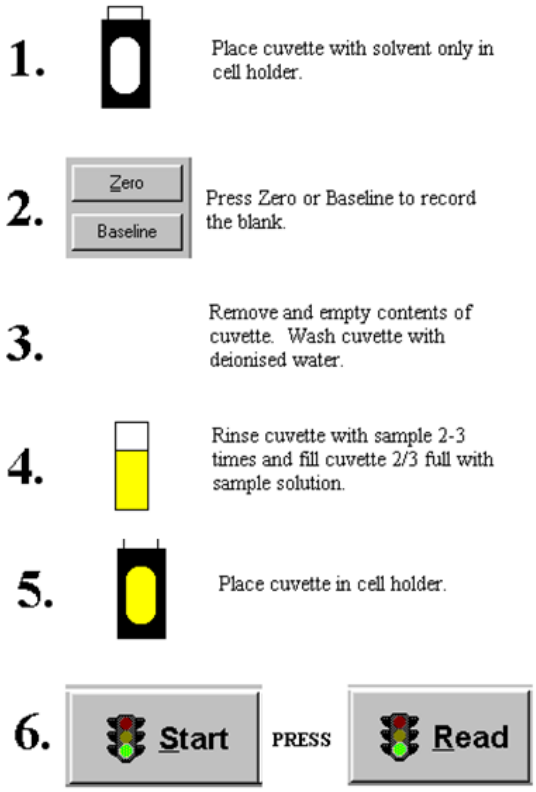

Figure 2. Step-by-step procedure to obtain baseline corrected spectra

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