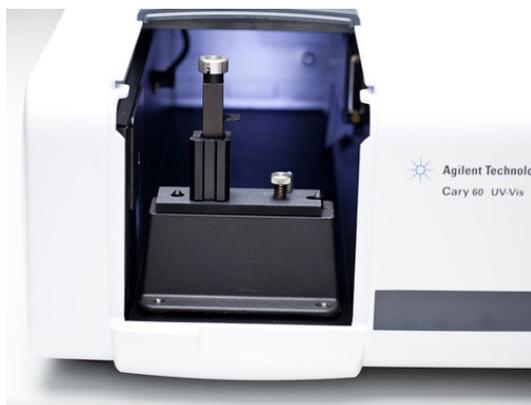


Determine Protein Concentration Using Microvolumes with the Agilent Cary 60 UV-Vis Spectrophotometer



Abstract

Modern labs are increasingly looking for time efficient-methods of protein estimation. The Agilent Cary 60 UV-Vis spectrophotometer combined with an ultra-microvolume cuvette provides a convenient and easy-to-use platform for the direct measurement of microvolume quantities (down to 3 μL) of protein samples without dilution.

The method is nondestructive, allowing recovery of precious samples, and cleaning is easy. The mirrored ultra-microvolume cuvette caps come in two sizes (1.0 and 0.2 mm path length), extending the concentration range of the system.

Compared to existing methods, which can be inaccurate or unrepeatable due to instrument limitations, the Cary 60 provides the highest accuracy and reproducibility, ensuring that you get the right answer every time.

Materials

- BSA protein (Sigma 9048-46-8)
- Ultra-microvolume cuvette with 1.0 mm mirrored cap
- Agilent Cary 50 or Cary 60 UV-Vis

Photometric linearity

When combined with the Agilent Cary 60 UV-Vis, the ultra-microvolume cuvette delivers superb photometric linearity to 2.3 Abs, equivalent to 23 Abs (using the 1.0 mm cell cap) and 115 Abs (using the 0.2 mm cap). This allows direct measurement of BSA protein samples from 0 to 190 mg/mL without time-consuming dilutions.

Figure 1. Measure BSA protein samples without time-consuming dilutions.

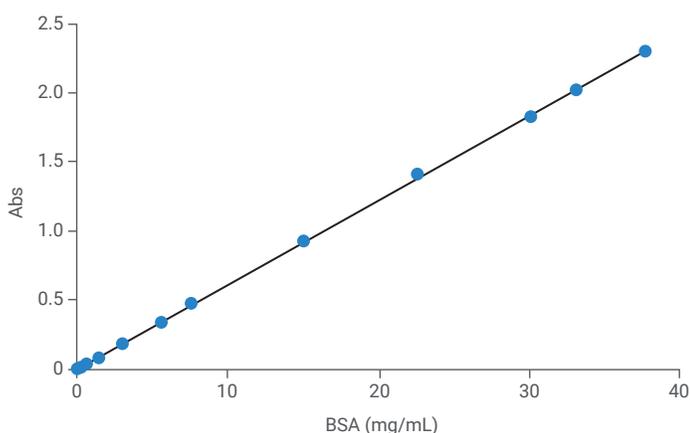


Table 1. Equivalent absorbance comparison.

	Standard Cuvette	Ultra-Microvolume Cuvette	
Path Length	10 mm	1.0 mm	0.2 mm
Max. Measured Abs	3.3 Abs	2.3 Abs	23 Abs
Equivalent Abs	3.3 Abs	23 Abs	115 Abs

Note: Equivalent Abs is the absorbance value calculated for a 10 mm path length. The benefit of being able to measure up to 115 Abs is that highly concentrated DNA or protein solutions can be measured – eliminating dilutions.

Fully flexible solution

For measurement of dilute samples, using a standard 10 mm path length cuvette is recommended, extending the limit of detection to 0.001 mg/mL. Cuvettes are available in a range of volumes from 40 μ L to 3.0 mL.

As most biolabs perform a wider range of measurements, the Cary 60 can be fitted with automated multicell changers as well as temperature-controlled cuvette holders, for performing enzyme kinetics studies. Components are easily interchangeable, making the Agilent Cary 60 UV-Vis the preferred choice for routine biological UV-Vis measurements.

Cleaning

The ultra-microvolume cuvette offers easy sample loading and cleaning with no sample carryover. Simply wipe clean with a lint-free swab and load your next sample with a pipette. This eliminates time-consuming cleaning procedures with more conventional cuvettes.

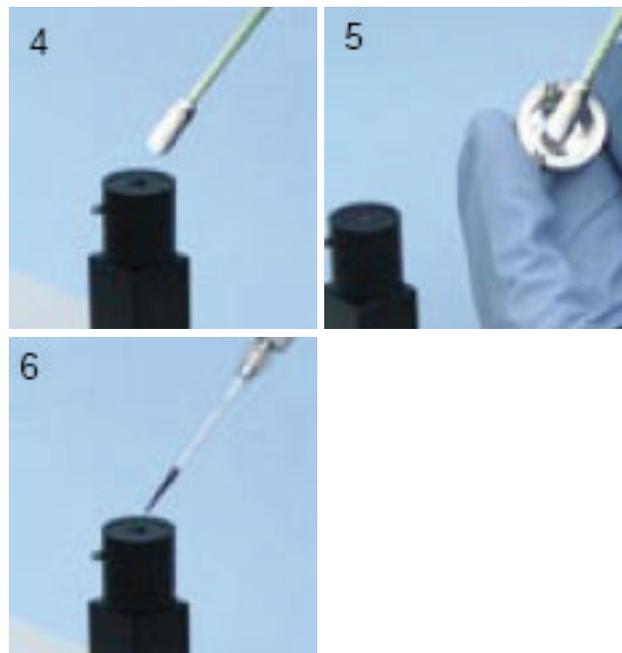
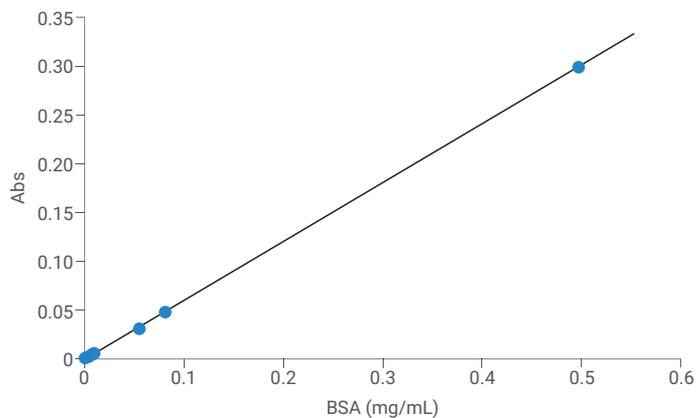


Figure 2. Wipe clean and load your next sample.

Limit of detection

Only the Agilent Cary 50 and Cary 60 UV-Vis offer the flexibility to change to a 10 mm path length, extending the limit of detection of BSA from as low as 0.001 mg/mL up to 190 mg/mL.

Figure 3. Extend the limit of detection by simply changing a cuvette.



Ordering information

Product	Part Number
Cary 60 UV-Vis with Cary WinUV Software and PC	G6860AA
Ultra-Microvolume Cuvette	G6871A
Add 0.2 mm Path Length Lid	G6871A#100

www.agilent.com/chem/cary60

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