Shimadzu Biospec-1601
DNA/ Protein/ Enzyme Analyzer

Features

DNA or protein concentrations are determined directly from the absorbances in the ultraviolet region (230nm, 260nm, and 280nm), without colorimetric operation.

The wavelengths and the formula used for quantitation are preset, so that the quantitation is performed by simple key operation. In addition, the wavelengths and factors used in computation can be arbitrarily changed.

The following two formulas are selectable.
(1) Formula using absorbances at 260 nm (A1) and at 230 nm (A2)
Absorbance ratio=A1/A2
DNA concentration=49.1 A1 3.48 A2
Protein concentration=183.0 A2 75.8 A1

(2) Formula using absorbances at 260.0nm (A1) and at 280.0nm(A2)
Absorbance ratio=A1/A2
DNA concentration=62.9 A1 36.0 A2
Protein concentration=1552 A2 757.3 A1
Note: The absorbance at 320.0nm can be used for background correction.

Protein concentrations are determined in any of the four coloring methods or directly from the absorbance at 280nm.

The instrument parameters for quantitation are preset.
- Lowry method
- BCA method (uses bicinchoninic acid)
- CBB method (Bradford method)
- Biuret method
- UV absorption method (uses absorbances at 280 nm)

The BioSpec-1601 incorporates all the fundamental performances and functions required in UV-Vis spectrophotometry.

 Measurement at a fixed wavelength
 Spectrum measurement
The wavelengths are scanned and the spectrum is recorded, which can be processed in many ways.
 Kinetics
Reaction rates and enzyme activity values are calculated.
 Quantitation
Quantitation may be performed by the single-wavelength, 2-wavelength, 3-wavelength, or derivative method.

Highly Stable Double-Beam Optics -Ideal for Trace Analyses

-Double-beam optics ensures highly stable data. The light beam is stopped down to provide low noise even in trace analyses

50L ultramicro cell and holder are standard.
The ultramicro cell holder allows vertical cell positioning, minimizing the difference in size of cells between brands.

OPTIONAL: Capillary cell option enables measurement of samples as small as 3□L.
All you do is aspirate the sample into the capillary tube and install the tube in the capillary cell adapter. The adapter is the same size as the standard 10 mm square cell, and hence is quite easy to handle. Capillary cell set: Cat. No. 206-69746

Application Example (Quantitation of DNA by UV absorption method)

In this mode, DNA or protein concentrations are directly calculated from the absorbances in the UV region. Measurements at three wavelengths and calculations are carried out in an automated sequence. Figure A shows the spectrum of aqueous solution (60□g/mL) of DNA (dioxyribonucleic acid), obtained using a 50□L ultramicro cell. Figure B shows the result given by the UV absorption method,and Figure C the printed out result.

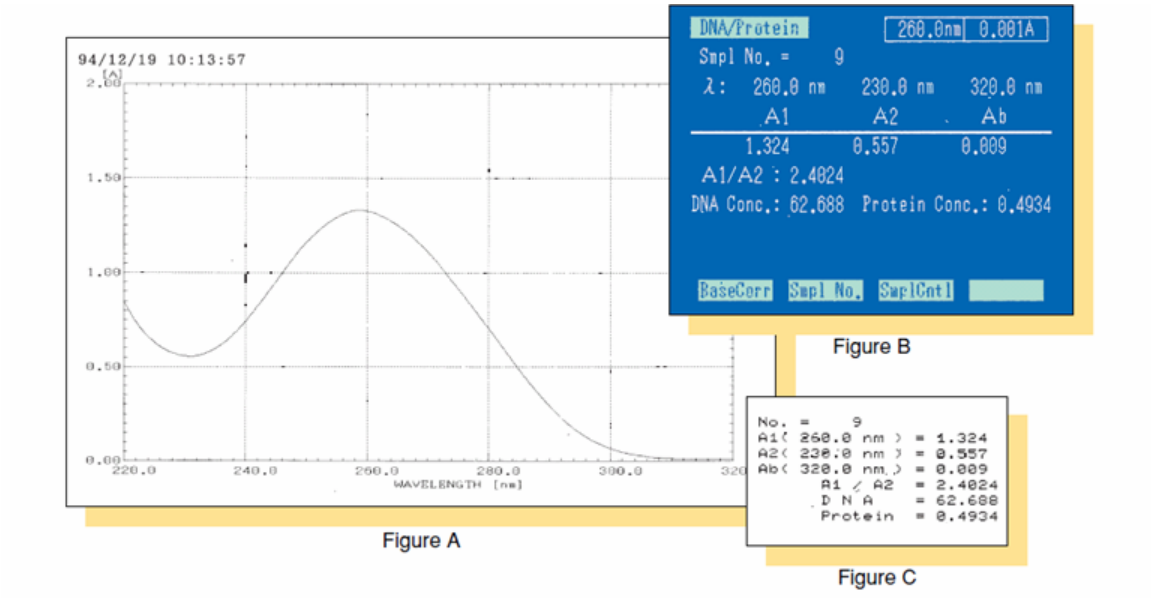

Figure A

Figure B

Figure C

Kinetics Measurement Using Multiple Cells
Long-Term High Stability Ensured by Douple-Beam Optics
Use of the CPC-240A Cell Positioner option (6-cell type, thermoelectrically temperature controlled) enables kinetics assay of up to six samples under a constant temperature conditions.

Software Specifications
Protein Quantitation

- Lowry method.
- BCA method.
- CBB method (Bradford method).
- Biuret method.
- UV absorption method (direct absorption spectrophotometry at 280nm).

DNA/Protein Quantitation

- Measurement of absorbance ratios at 260nm and 230nm and at 260nm and 280nm.
- Background correction using absorbance at 320nm.
- Direct quantitation using Warburg and Christian factors.
- Absorbance ratio calculation for user selected wavelengths.
- Concentration calculation using arbitrary factors.

Photometric mode Measurement at a user-selected wavelength
Quantitation mode

- Quantitation by 2 or 3 wavelength calibration.
- Quantitation by derivatives.
- Calibration curves of 1st through 3rd curves.

Kinetics mode Measurement of reaction rate and enzyme activity.

Data processing

- Processing of spectra and time-course curves.
- Arithmetic calculation.
- Derivatives.
- Peak pick.
- Point pick.
- Data readout at cursor specified points.

Hardware Specifications
Photometric system Double-beam system
Baseline stability 0.001 Abs. / hour or better
Baseline flatness 0.002 Abs.
Wavelength range 190.0 to 1100.0nm
Wavelength accuracy □0.5 nm (Automatic wavelength correction)
Wavelength repeatability □ 0.1 nm
Wavelength drive speed About 6000 nm/min. slewing, and about 3200 to 160nm/min scanning.
Stray light 0.05% or less at 220.0nm and 340.0nm
Spectral bandwidth 2 nm
Photometric range □0.5 to 3.999 Abs. and 0.0 to 300 %T
Photometric accuracy □ 0.004 Abs. at 1.0 Abs. and □0.002 Abs. at 0.5 Abs. (Tested with NIST 930D filters)
Photometric repeatability □0.002 Abs. at 1.0 Abs. and □0.001 Abs. at 0.5 Abs.
Noise level 0.0005 A or less at 500 nm
Dimensions and weight 550W 470D 200H mm, 18 kg
Other features An ultramicro cell holder and two ultramicro cells are supplied as standard.

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