Technical Report

UV No.160002 Spectrophotometer

HITACHI
Inspire the Next

Analysis of DNA by U-5100 UV/VIS Spectrophotometer

DNA shows absorption in a specific wavelength region. Therefore, the absorbance measurement allows the concentration determination and purity confirmation. The absorbance of 1 at 260 nm generally indicates 50 µg of double-stranded DNA (dsDNA), 33 µg of single-stranded DNA (ssDNA), or 40 µg of RNA and thus, a nucleic acid concentration can be calculated based on the absorbance at 260 nm. Furthermore, as the absorption maximum for proteins occurs at 280 nm, by calculating with respect to the nucleic acid absorbance at 260 nm and comparing with the expected value, the purity can be confirmed from the protein contamination ratio. This time, Lambda DNA was analyzed by using a commercially available disposable micro cell.

U-5100 UV/VIS Spectrophotometer

Absorption Spectrum Measurement for Lambda DNA

- ✓ When a calibration curve of Lambda DNA was prepared for the range of 2 - 60 ng/µL, a good correlation result (R^2 =0.999) was obtained.
- ✓ The absorbance ratio (A260/A280) for Lambda DNA 30 ng/µL was 1.96. For DNA, 1.8 or higher ratio is considered high purity and thus, it was indicated that the purity of this sample was high.
- ✓ By selecting the low speed for the response under the analytical conditions, the noise can be reduced.

■ Analytical Conditions

Instrument	U-5100 UV/VIS Spectrophotometer
Measurement wavelength range	230-330 nm
Scan speed	200 nm/min
Slit	5 nm
Sampling interval	1 nm
Response	Low speed

■ Accessory

Single cell holder (P/N: 3J2-0110)
Eppendorf AG UVette® (Optical path length: 10 mm)
UVette® adapter (4099002.005)

Single Cell Holder

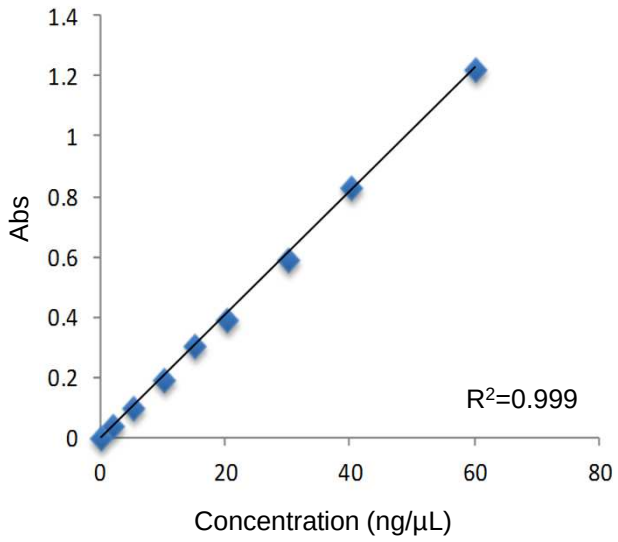
Note: Please contact Eppendorf AG for the detailed information on the cell and adapter to be used.

* "UVette" is a registered trademark of Eppendorf AG. in Germany and other countries.

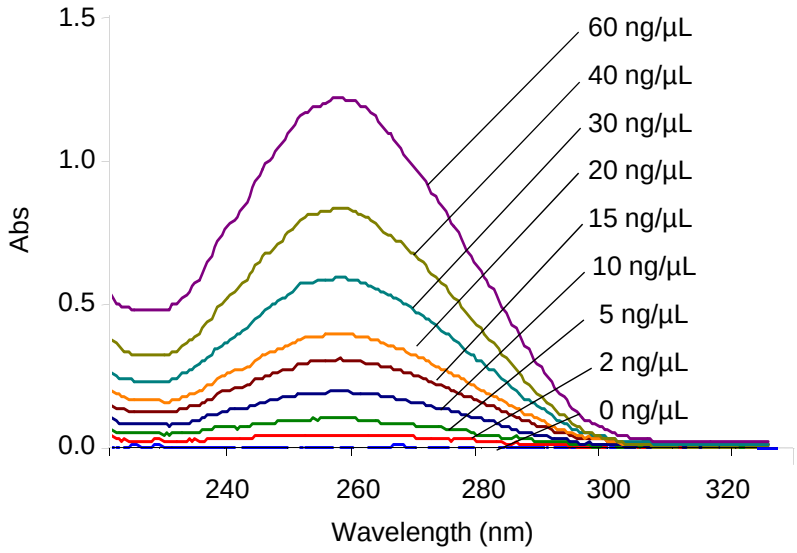
■ Sample

Sample: Lambda DNA (NIPPON GENE CO., LTD.)
Solvent: TE buffer (10 mM Tris HCl, 1 mM EDTA)

■ Calibration Curve of Lambda DNA



■ Absorption Spectrum of Lambda DNA



NOTE: These data are an example of measurement; the individual values cannot be guaranteed.

[KEY WORDS]

Bio/Medical Science/Food/Pharmaceutical, DNA, Spectrophotometer, U-5100, UH5300, U-2900, RNA, Nucleic Acid, Absorption Spectrum, Micro Cell, Absorbance

Hitachi High-Tech Science Corporation
24-14, Nishi-shimbashi 1-chome, Minato-ku Tokyo 105-0003, JAPAN
TEL: +81-3-6280-0062
http://www.hitachi-hightech.com/global/hhs/