

Application News

No. A608

Spectrophotometric Analysis

Quality Verification Testing Using VisEase™ Simple Control Application

Ultraviolet and visible light (UV-Vis) spectrophotometers are used routinely in various industries for raw material receiving inspections and confirmation of product quality. VisEase, is simple control application that can be operated on a personal computer, and is a simplified application program that includes only the minimum interface necessary for measurements. Narrowing the range of operational applications in VisEase responds to customer needs by minimizing the operational procedure before the start of measurement, and providing an easy-to-use option for work that does not require data processing and analysis.

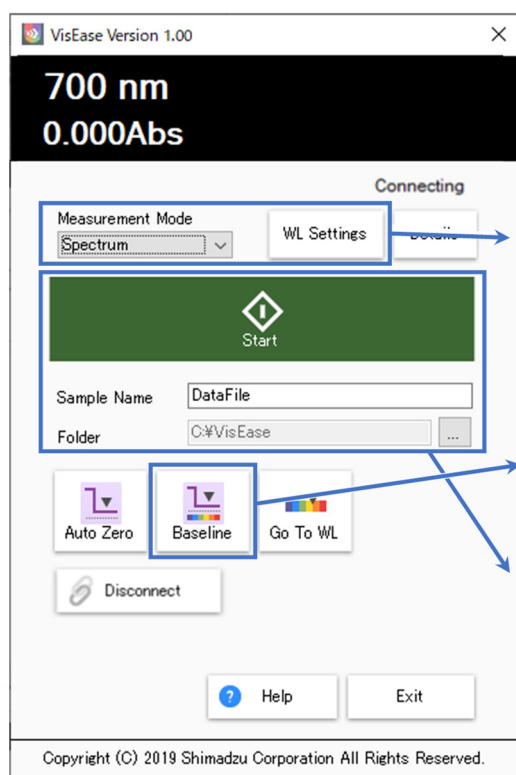
This article introduces the simplicity of VisEase in an example of quality verification testing of pure water.

It should be noted that VisEase control is only applicable to Shimadzu UV-1280 and UV-1900 Series spectrophotometers.

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■ Features of VisEase

The UV-1280 and UV-1900i currently available from Shimadzu are models that enable operation from the touch panel or keyboard attached to the body of the spectrophotometer. The UV-1900i can also be operated from a personal computer by using the dedicated control software LabSolutions™ UV-Vis. In addition to measurement, LabSolutions UV-Vis also includes a variety of evaluation functions and a pass/fail judgment program. Because the VisEase application introduced here has only the minimum necessary functions, it is easy to understand, even for first-time UV-VIS spectrophotometer users, and also easy to use in everyday routine work. Fig. 1 shows the VisEase operation screen and measurement procedure. When the program is opened, it connects automatically to the device and measurement can begin immediately. If the measurement conditions are set in advance, measurement is completed simply by inputting the sample name and clicking the start button. Data can be output in either the text format or Excel format.



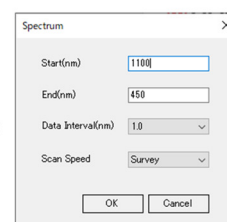
◆ Measurement procedure (Spectral measurement)

1 Start the device and open the application.

VisEase is connected to the device simultaneously with startup.

2 Set the measurement conditions.

Three measurement modes can be selected: Spectrum, Photometric, and Time Course. Set the wavelength, scan speed, and other conditions.



3 Measure the baseline.

When measuring a solution, set the solvent.

4 Start the measurement.

Input the sample name and click the start button.

✓ Measurement conditions can be saved.

When conducting measurements under the same conditions, only steps 1→3→4 are necessary.

◆ Output methods

- Output text file
- Export to Excel

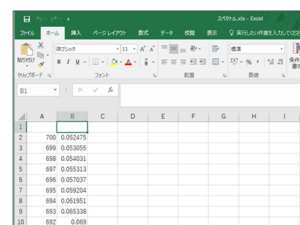
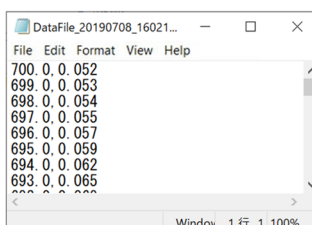


Fig. 1 VisEase Operation Screen and Measurement Procedure

Quality Verification Test of Pure Water

Although pure water does not display absorbance in the UV-VIS region, UV absorbance is a characteristic of many organic substances. Therefore, if pure water is contaminated with an impurity such as an organic solvent, its UV absorbance tends to increase. In this experiment, we conducted photometric measurements at 230 nm to determine whether samples showed absorbance originating from impurities in the UV region. The samples were three types of pure water and one sample which was prepared by mixing a trace amount of ethanol in pure water. The measurements were conducted using a Shimadzu UV-1900i and VisEase. Fig. 2 shows the appearance of the measurement samples. All four samples are colorless transparent solutions, and no impurities can be detected by visual inspection. Fig.3 shows the appearance of the spectrophotometer, and Table 1 shows the measurement conditions.



Fig. 3 UV-1900i UV-VIS Spectrophotometer

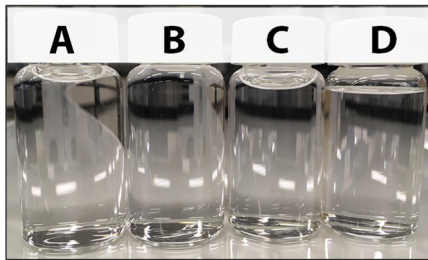


Fig. 2 Appearance of Measurement Samples

Table 1 Measurement Conditions

| | |
|------------------------|---------------|
| Scan mode | : Photometric |
| Measurement wavelength | : 230 nm |
| Integral time | : 1 s |
| Photometric value | : Absorbance |
| Slit width | : 1 nm |

In photometric measurements using VisEase, the measurement data stored in the folder set as the save location are saved in a text file. The measured wavelength and photometric value are recorded in the text file. It is also possible to output multiple measurement results in the same Excel sheet by using the Excel export function.

Table 2 shows the measurement results. Although the absorbance of samples B, C, and D was 0.000 Abs, sample A showed absorbance of 0.030 Abs in the UV region. Based on this, it was found that sample A was contaminated with the impurity ethanol.

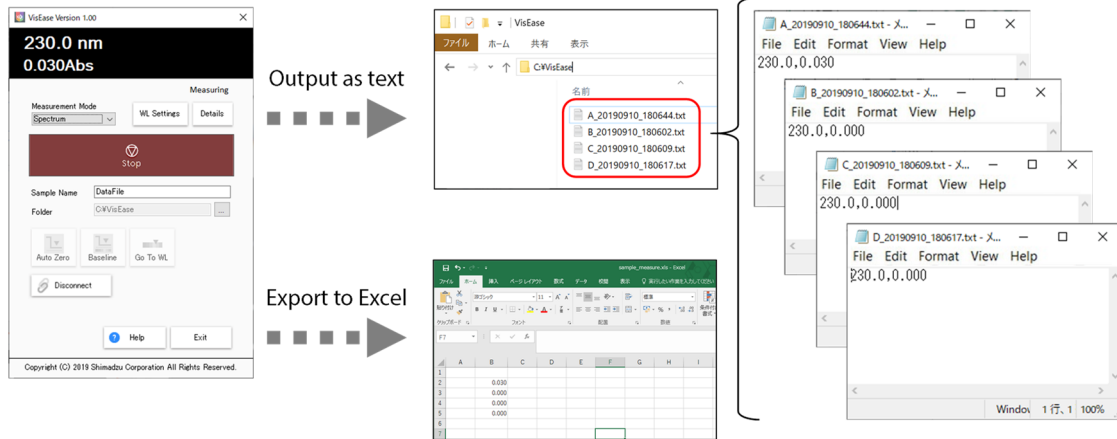


Fig. 4 Methods of Saving Measurement Results in VisEase

Table 2 Measurement Result

| Sample | Absorbance (Abs.) |
|--------|-------------------|
| A | 0.030 |
| B | 0.000 |
| C | 0.000 |
| D | 0.000 |

Conclusion

An example of a water quality verification test using the simple control application VisEase was introduced. Use of VisEase enables faster, simpler daily routine work.

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