



Measurement of near-infrared light absorbing dyes using the UH5700

Near-infrared light absorbing dyes absorb near-infrared light at wavelengths of 700 to 2500 nm and are used in applications such as heat-shielding films and anti-forgery ink. Since the use of a continuously variable slit, the UH5700 can make low-noise measurements over a broad wavelength region (190 to 3300 nm). Here, we measured the absorption spectra of five near-infrared absorbing dye samples using the UH5700 and detected the peaks with UV Solutions Plus specialized software.



Model UH5700 Spectrophotometer

Measurement of absorption spectrum of near-infrared light absorbing dyes

- ✓ Near-infrared light absorbing dye powders were dissolved in toluene to produce samples for measurement.
- ✓ As a reference, the absorption spectrum of toluene was measured with the UH5700.
- ✓ Spectra were obtained with maximum absorption peaks around wavelengths of 800 to 1000 nm.
- ✓ Spectra were obtained with a low step size at the detector switchover wavelength of 850 nm.
- ✓ By employing a continuously variable slit in which the slit automatically widens when measuring low quantities of light, low-noise spectra could be obtained even near the detector switchover wavelength where the energy is low.

■ Measurement data

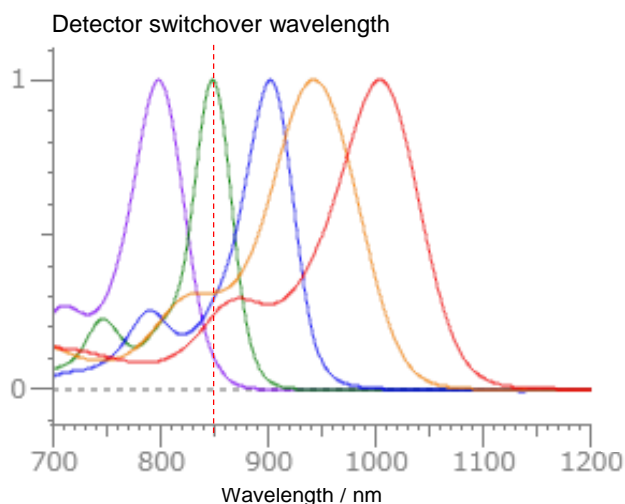


Figure 1 - Absorption spectra of near-infrared light-absorbing dyes*1

*1 The vertical axis shows values normalized by the maximum peak wavelength for each sample

■ Peak detection

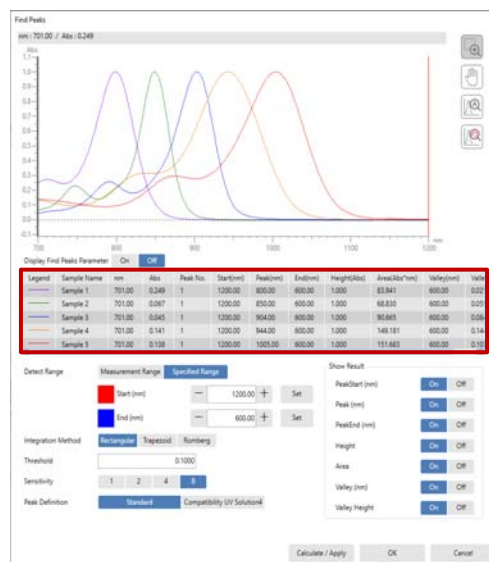


Figure 2 - Peak detection settings screen

■ Measurement conditions

Scan speed: 300 nm/min (UV-Vis)
300 nm/min (NIR)
Slit: 8 nm (UV-Vis), automatic (NIR)
PbS sensitivity: 1
Sampling interval: 1 nm

Table 1 - Peak detection results for near-infrared light absorbing dyes

No.	Sample Name	Peak No.	Start(nm)	Peak(nm)	End(nm)	Height(Abs)*2	Area(Abs*nm)
1	Sample 1	1	1200.00	800.00	600.00	1.000	83.941
2	Sample 2	1	1200.00	850.00	600.00	1.000	68.830
3	Sample 3	1	1200.00	904.00	600.00	1.000	90.665
4	Sample 4	1	1200.00	944.00	600.00	1.000	149.181
5	Sample 5	1	1200.00	1005.00	600.00	1.000	151.683

*2 Height (Abs) indicates values normalized by the maximum peak wavelength for each sample

- ✓ Peak detection was carried out using the measured absorption spectra.
- ✓ The wavelength range and detection method used can be set in the UV Solutions Plus specialized software, and multiple peaks can be simultaneously detected. In addition, peak detection results can be displayed in tabular form as in Table 1.

Note: The external appearance and specifications of the products mentioned in this technical report are subject to change for improvements. The data appearing in this document represent an application example and are not a guarantee of performance.

[KEY WORDS]

spectrophotometer, UH5700, absorption spectrum, near-infrared light absorbing dye, solution