Laser Flash Photolysis System

TSP-1000 / TSP-1000M

TSP-1000 is a laser flash photolysis system for use in the measurement of transient absorbance. It is in wide use for the analysis of the elementary processes of photochemical reactions. With a nanosecond pulsed laser as the exciting light source, this system makes it possible to measure transient UV-VIS absorption in a broad range of nanosecond to milisecond.

Data are acquired by the combination of a photomultiplier detector and a digital oscilloscope in the single-wavelength monochromator system, and by the combination of a photodiode array detector and a high-speed AD converter in the multi-channel spectrophotometer system. In both systems, time resolution up to 10 nsec is available.
Laser Flash Photolysis System

TSP-1000 / TSP-1000M

System Components

<table>
<thead>
<tr>
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<th>TSP-1000 (M)-01</th>
<th>TSP-1000 (M)-02R</th>
<th>TSP-1000 (M)-03R</th>
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</thead>
<tbody>
<tr>
<td>Exciting light Source SL type</td>
<td>1</td>
<td>0 (•)</td>
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<tr>
<td>Exciting light Source ML II type</td>
<td>1</td>
<td>0 (•)</td>
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<td>Monitoring light Source (150W Xe lamp)</td>
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<td>0 (•)</td>
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<td>Light Guide for light path</td>
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<td>0 (•)</td>
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<tr>
<td>Sample cell holder</td>
<td>1</td>
<td>0 (•)</td>
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<tr>
<td>Data Processor</td>
<td>1</td>
<td>0 (•)</td>
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<tr>
<td>Spectrometer MD200 (-01)</td>
<td>•</td>
<td>0 (•)</td>
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<tr>
<td>Spectrometer MD308 (-03)</td>
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<tr>
<td>Monochromatic Detector</td>
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<tr>
<td>Multi-channel Detector</td>
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*1 Use for Single-wavelength monochromator system  *2 Use for Multi-channel spectrophotometer system

Specifications

Exciting Light Source (Pulsed YAG Laser)
- Pulse Width: 4 – 6 nsec
- Energy (TSP-1000): 200mJ@532nm, 60mJ@355nm
- Energy (TSP-1000M): 25mJ@532nm, 8mJ@355nm
- Repetition Rate: 10Hz (single pulse available)

Monochromatic Detector
- Lamp: 150W Xe arc lamp of high stability
- Lamp House: Air-cooling type
- Light Intensity Adjustment: Iris function available with a space to insert an optical fiber
- Light Guide for Light Path: Fiber optics made of quartz (transmittable in the range of 200nm – 1000nm)
- Length: 1m

Single-Wavelength Monochromator System

Spectrometer MD200
- Optical Alignment: Czerny-Turner grating
- Focal Distance: 200mm
- Speed: F/3.5
- Linear Dispersion: 8.5nm/mm
- Slit Width: 0.1mm, 0.2mm, 0.5mm

Monochromatic Detector
- Detector: Photomultiplier tube
- Response: 5nsec or less
- High-voltage Power Supply: 0 – 1100 V adjustable
- Control Circuit: Wavelength scanning circuit
- Digital Oscilloscope: High voltage feedback circuit
- Sampling rate: 1.25GS/s max
- Vertical sensitivity: 1mV/div – 10W/div
- Time axis range: 40nsec/div – 10sec/div

Optional Accessories
- Exciting Light Source 266nm
- Dye Laser (420nm – 650nm)
- OPO Wavelength-Changeable Laser

Standard Systems

- Single-wavelength Monochromator System
  TSP-1000(M)-01R
- Multi-channel Spectrophotometer System
  TSP-1000(M)-02R
- Single-wavelength/Multi-channel Spectrophotometer System
  TSP-1000(M)-03R

Sample Cell Holder
- Temperature Range: 5°C – 60°C
- Temperature Control: By a bath circulator
- Cell: 10mm-square quartz cell (transparent in 4 sides)
- Spaces for Optical Filters: At the exciting side and the detection side

Data Processor
- OS: Windows 95/98/Me/2000/XP
- Control Interface: DIO (PCI), GPIB (PCI)
- Software: Averaging, Overlaying, Converting of wavelength axis and time axis, Non-linear least squares fitting, Data storing in text format

Multi-Channel Spectrophotometer System

Spectrometer MD308
- Optical Alignment: Czerny-Turner grating
- Gratings: 3 different gratings automatically changeable
- Focal Length: 300mm
- Speed: F/4
- Linear Dispersion: 5.4mm/mm (when using the 600g/mm grating)
- Slit Width: 10mm – 3mm continuously changeable

Multi-Channel Detector
- Detector: Photodiode array 1024ch with a gated image intensifier
- Time Resolution: 5nsec – 10nsec
- Image Intensifier Gain: Adjustable
- Synchronization Control: Pulse generator with GPIB interface
- Wavelength Range of: 100nm, 200nm, 400nm
- Simultaneous Measurement: 400nm when using MD200

Optional Accessories
- Flash Lamp as a monitoring light Source
- Low-Temperature Cell Chamber (-80°C – 100°C)
- Stopped-Flow Moir (for flow flash measurement)
- Bath Circulator
- Optical Filters

Specifications and appearances are subject to change without prior notice