

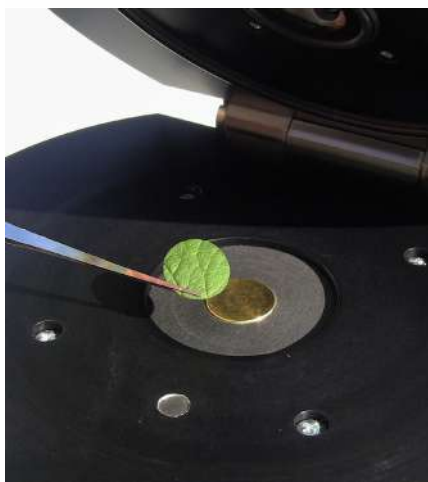


Thermoluminescence Instruments TL 500/ST, TL 500/HT, TL 500/LT

PSI Thermoluminescence instruments are designed to investigate structure of energetic levels in the Photosystem II. Light-induced charge separation in the Photosystem II reaction centers results in accumulation of radical pairs that store the absorbed light energy. Heating induces recombination of these radical pairs and it triggers light emission and formation of characteristic thermoluminescence glow curves. The shape and the peak position temperature of the different thermoluminescence bands provide valuable information about the energetic stability of the respective radical pairs as well as about the functioning of the Photosystem II reaction centers. Interpretation of the obtained data requires a thorough understanding of the charge pairs responsible for generating different thermoluminescence bands. High-temperature thermoluminescence appears as a result of accumulation of lipid peroxides and can be used as a simple and efficient tool to monitor oxidative stress in plants.

▼ APPLICATIONS

- Non-invasive monitoring of the PSII electron transport
- PSII adaptation and responses to abiotic and biotic stresses, structural modifications, mutations
- Tests of herbicides cos TL allows to probe energetic stability of reduced quinone electron acceptors
- Redox reactions of PSII in thylakoid membrane
- Interpreting changes in the redox potentials of donors and acceptors on the basis of a shift in glow peak temperature
- Oscillation pattern of TL can denote the "S" state transition and can be used for a titre of the Mn clusture of oxygen evolving complex



▼ KEY FEATURES

- Typical samples are leaf discs, algal cells and cyanobacterial cells, thylakoids, or PSII preparations
- Different wide temperature range for measuring in the temperature range from -90 to +170 °C
- Low temperature version TL500/LT contains integrated liquid nitrogen tank with software controlled solenoid valve.
- Illumination by a Single Turnover Flash of user defined intensity and duration
- Alternative pre-illumination by an actinic light of variable intensity and duration at predefined temperatures
- Sensitive photomultiplier for TL glow peak detection
- Software controlled electronic shutter prevents photomultiplier before damage
- Precisely linear heating process controlled by thermoelectric cooler regulation in whole heating range
- Additional air input for the controlled atmosphere inside the measuring chamber (high temperature version)
- Ambient light shielding enables measurements at standard laboratory conditions

▼ TECHNICAL SPECIFICATION

- **Temperature Range:**
 - Standard version: -25 to +70 °C
 - Liquid Nitrogen version: -90 to +70 °C
 - High-Temperature version: -15 to +170 °C
- **Temperature Mode:**
 - Linear temperature change:
 - Thermoluminescence 0.1–2 °C/s
 - Chemoluminescence 0.1–1 °C/s
- **Overheating Protection:** Yes
- **Minimum Sampling Period:** 100 ms
- **Temperature Control:** Manual (constant temperature) or Autonomous-protocol defined temperature profiles.
- **Sample Disc:** made of gold-plated copper
 - standard and low temperature version: diameter 14 mm
 - high temperature version: diameter 22 mm
- **Typical Sample:** Algal or cyanobacterial suspensions; Leaf segments
- **Saturating Pulse Illumination:** 625 nm, up to 250,000 $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$
- **Actinic Illumination:** 625 nm, up to 1,500 $\mu\text{mol}\cdot\text{m}^{-2}\cdot\text{s}^{-1}$
- **Sensor:** Photomultiplier with software control of the sensitivity
- **Spectral Response:** 300–900 nm
- **Switch-On Delay:** 100 ms
- **Ambient Light Protection:** Yes
- **Control:** Custom defined protocols with variable timing, special language and scripts
- **Communication:** RS232/USB
- **Software:** FluorWin 3.7
- **Electrical:** 90 V–240 V

▼ VERSIONS:

TL 500/ST

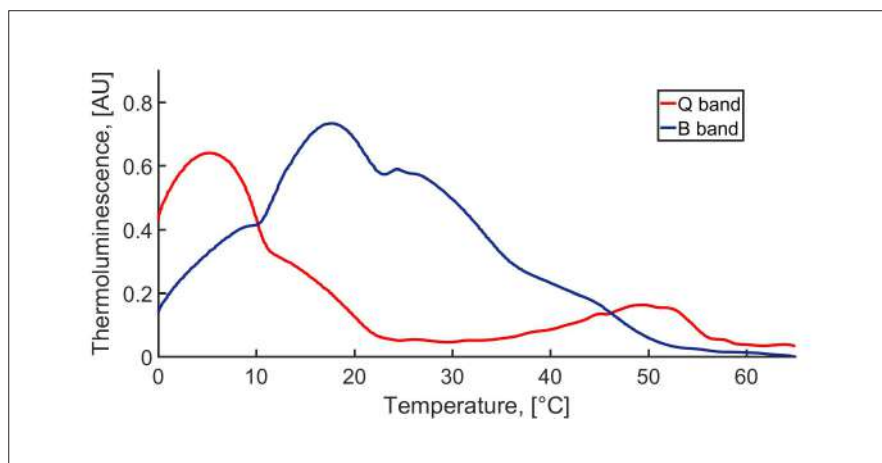
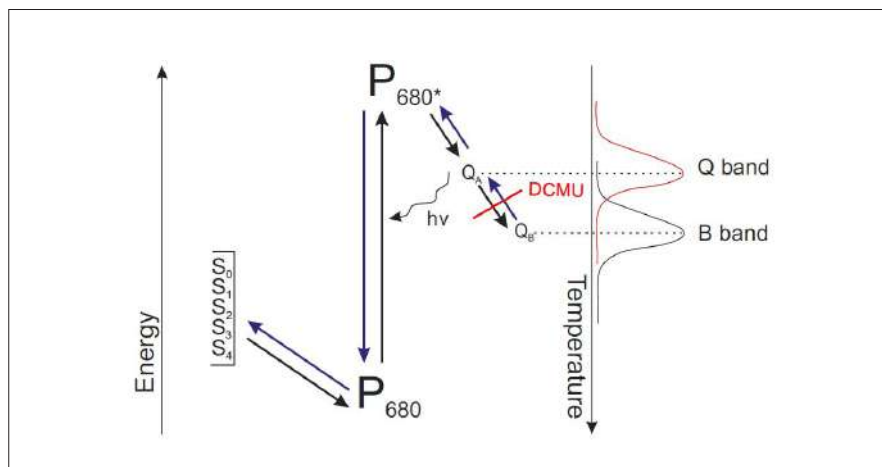
- -25 to +70 °C
- Standard version investigates the Q,A,B1,B2,C,AG glow curve peaks

TL 500/HT

- -15 to +170 °C
- High temperature version for glow curves peak measurements in the range up to +170°C

TL 500/LT

- -90 to +70 °C
- Low temperature liquid nitrogen version allows monitor Z1 glow curve peak (liquid nitrogen tank included)



▼ SOFTWARE

- Creation and saving of experimental protocols
- FluorWin Wizard for comfortable protocols scripting
- Retrieval and export of experimental data
- Data manipulation and visualization
- Windows 7, or higher compatible

