doi:10.1351/goldbook.P04952

pump-probe technique

Transient absorption spectroscopy using two pulses (strong pump and weak probe) and capable of achieving a high temporal resolution. A pump pulse excites the sample and triggers the process under investigation. A second delayed pulse, the probe, monitors an optical property. By varying the time delay between the pump and probe pulses, it is possible to assemble measurements as a function of time. The probe pulse is typically a UV, visible or infrared pulse in which case a snap-shot spectrum is taken as a function of the delay time. Often the probe pulse is generated from a portion of the excitation beam, but it can also be an independently generated electromagnetic pulse.
Note:
In the case of an optical probe, this interaction is formally a non-linear optical process that is third-order in polarization. The excitation intensity to create the excited state constitutes a two-field interaction and the determination of the change in the time-dependent optical properties involves a third field monitoring the induced time-dependent changes in the 'linear susceptibility'. Diffractive probes (e.g., electrons and X-rays) can also be used, in which case one measures a diffraction pattern as a function of time.

Source:
PAC, 2007, *79*, 293 *(Glossary of terms used in photochemistry, 3rd edition (IUPAC Recommendations 2006))* on page 404

