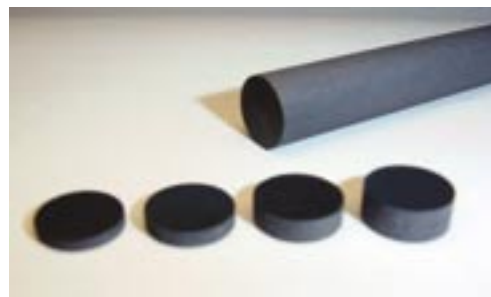


Development of a Thermal Diffusivity Reference Material for the Laser Flash Method

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The laser flash method is generally acknowledged as a standard and most popular method to measure thermal diffusivity of solid materials above room temperature. Since surface of optically nontransparent and dark materials can be directly heated by the laser pulse and measured without black coating, we selected a grade of isotropic graphite and characterized homogeneity and stability as a candidate reference material. We proposed a new calibration procedure of the laser flash instruments using a set of specimens of same thermal diffusivity with different thicknesses. The specimen sets with SI traceable thermal diffusivity value will be supplied soon.



Specimens of a candidate reference material for the laser flash measurement

Development of Highly Sensitive Visible-Near IR Transient Absorption Spectroscopy

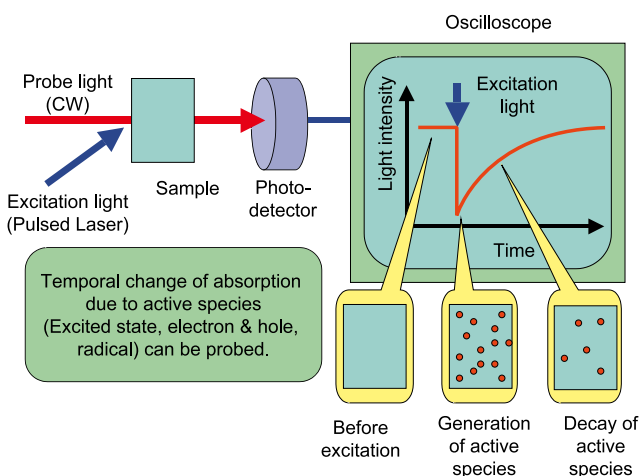
- Observation of conducting electrons in photo-chemical devices -

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Transient absorption spectroscopy was developed to observe active species produced by light excitation (see figure). Application fields of this technique have been limited because of low sensitivity. Thus, we developed highly sensitive transient absorption spectrometer. In our system, very small absorbance change ($< 10^{-5}$) in wide-wavelength-range (400-3000 nm) can be detected with 50 ns time resolution, while 10^{-3} absorbance can barely be detected by conventional system. Using the spectrometer, we have studied primary processes of various photo-functional devices, such as dye-sensitized solar cells and

photocatalysts. This spectrometer can be also used for trace analysis of molecules in solution.



Principle of transient absorption spectroscopy