

Prof. Hirotsugu Hiramatsu / Dept. of Applied Chemistry

Physical Chemistry, Molecular Spectroscopy, Biomolecular Science

New knowledge is brought from new experiments. We are trying to develop new experimental methods using vibrational spectroscopy and to find new information about biomolecules, living cells & life.

Infrared electroabsorption spectrometer has been developed to study responses of biomolecules to external electric field (Fig. A): it detects changes in (bio)molecular structure that cause changes in IR absorption as small as 10^{-7} . This apparatus is applied to electric field effects on biomolecules by further improving the sensitivity of this spectrometer. Research interest also covers structural chemistry of biomolecules. We have accomplished structural analysis of amyloid fibrils by means of IR linear dichroism (Fig. B), site-specific edition of stable isotopes (Fig. C), and establishing Raman marker band (Fig. D). And we have developed a device for enhancement of Raman signals (Fig. E). Development of further new experimental methods are underway.

Key Facilities: IR electroabsorption spectrometer, peptide synthesizer, Raman microscopes/spectrometers

