

# 13<sup>th</sup>-24<sup>th</sup> October 2008: Fluorescence Spectroscopy

(Prof. Seidel, Uni Düsseldorf, Molecular Physical Chemistry)

## Basics

UV-VIS adsorption spectroscopy, Beer-Lambert law, Jablonski diagramm, Stokes shift of the fluorescence and dynamical relaxation processes in the condensed phase. Spectral properties: fluorescence spectra, Fluoreszenzanregungsspektren, spectrometers, flourophors, fluorescence quantum yield (definition, measurement). Intensity: concentration dependence, inner filter effect, fluorescent marking.

## Quenching

Fluorescence life time: kinetic derivation and application. Static and dynamic quenching. reactions in the electronically excited singlet state.

### Practical exercise: Stern-Volmer relationship

## Fluorescence anisotropy

Fluorescence anisotropy: polarized light, photoselection (definition and derivation), fundamental anisotropy, rotation diffusion, time depeence, Perrin equation.

### Practical exercise: fluorescence anisotropy

## Fluorescence resonance energy transfer (FRET)

Measurement of structures and dynamics of biomolecules by FRET.

### Practical exercise: FRET

## Multi-parameter fluorescence detection (MFD)

Single molecule fluorescence spectroscopy and MFD, basics of fluorescence correlation spectroscopy (FCS).

### Practical exercises: FCS, MFD