

Chair of Physical Chemistry  
Faculty of Chemistry and Chemical Technology  
University of Ljubljana  
Slovenia

Janez Cerar  
janez.cerar@fkkt.uni-lj.si

# Research activities at the Chair of Physical Chemistry

(consists of several senior researchers, some ERS's and PhD students)

Studies (experimental and theoretical aspects) of aqueous and non-aqueous solutions of

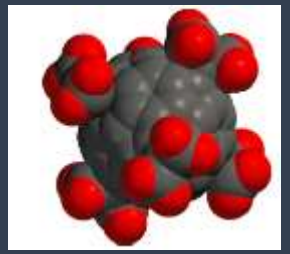
- electrolytes,
- polyelectrolytes,
- surfactants and
- biological polymers



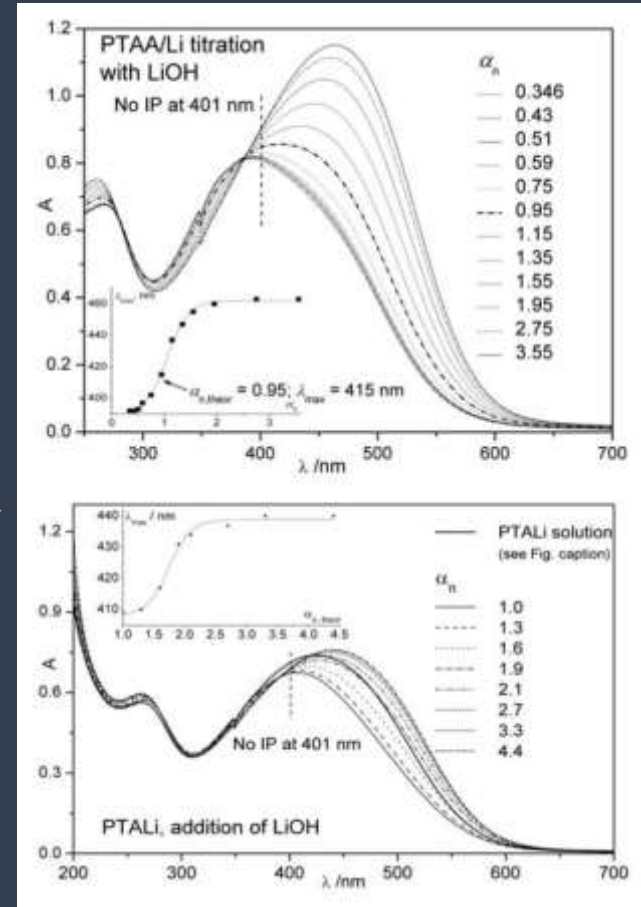
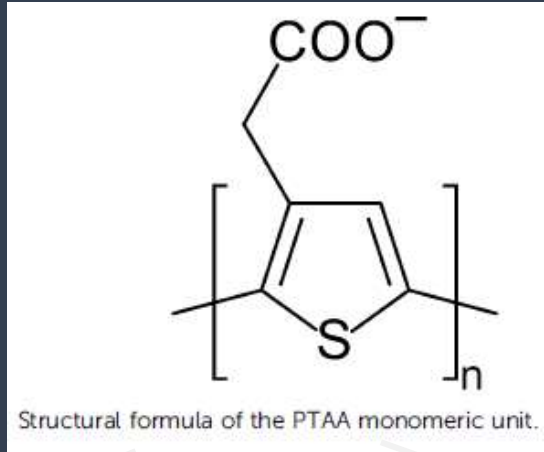
## Equipment:

- several UV-VIS Spectrophotometers
- 2 Fluorimeters (Luminescence Spectrometer)
- System for High-Performance Electrical Conductivity Measurements of Solutions
- 2 Automatic Titrators
- 3D DLS Spectrometer
- 2 Nano Differential Scanning Calorimeters
- CD Spectrometer
- 2 Isothermal Titration Microcalorimeters
- 1 Isothermal Titration Calorimeter
- Small Angle X-Ray Scattering Instrument
- osmometers (crioscopic, membrane, vapour pressure)
- several vibrating tube densimeters (for liquids/solutions)
- Flow Calorimeter, Batch Calorimeter
- Differential Diffractometer DnDc 2010
- Thirteen- Node Computer Cluster Based on Quad-Core Intel Q9550 CPUs
- Twenty -Node Computer Cluster Based on Quad-Core Intel Core i5 2500 CPU
- Viscometer System
- HPLC System Knauer

**Related research interests:** studies of aqueous solutions of fullerene-based compounds and conjugated polyelectrolytes in solutions (ionic electrochemistry)

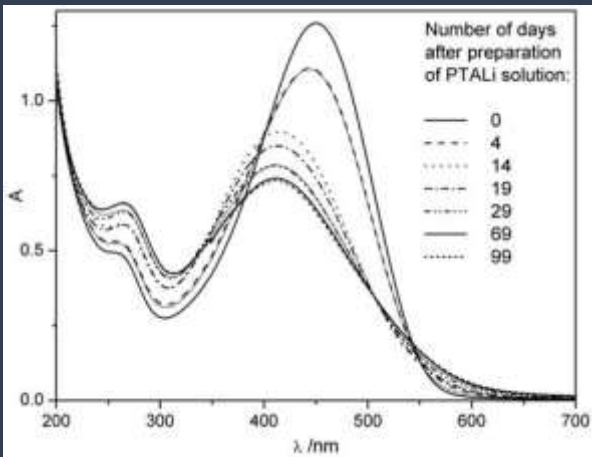


By-products of studies of properties of polythiophene-based compounds in water:

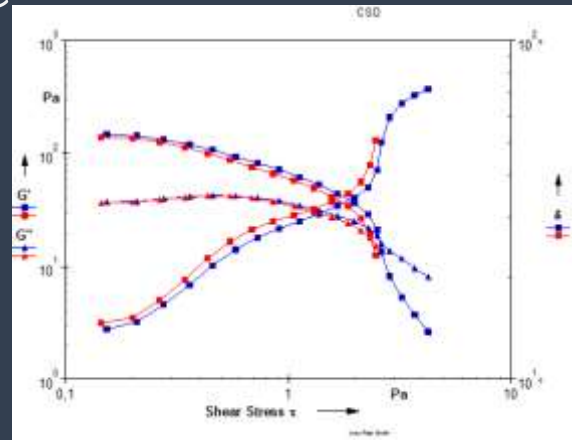


ageing of LIPTAA aqueous solution in darkness

ageing depends on conformation



UV/Vis spectrum of PTALi solution in water as a function of time



some old samples (kept dried) form gels

evolution of UV/Vis spectrum of aged sample as a function of initial conformation

## What we could contribute to COST MP1307?

- experience with aqueous solutions of polythiophene- and fullerene-based compounds
- characterization of (aqueous) solutions

## Other possible candidates for cooperation from Slovenia:

- Laboratory for Materials Chemistry (National Institute of Chemistry ), Ljubljana
  - scanning transmission electron microscope (STEM)
  - X-ray Absorption Near Edge Structure (XANES)
  - Energy-dispersive X-ray spectroscopy (EDS)
  - X-ray diffraction (XRD)
- Laboratory of photovoltaics (FE, University of Ljubljana), Ljubljana