



SOFT CRYSTALS

Grant-in-Aid for Scientific Research on "Innovative Areas" for FY 2017-21 (Area Number 2903)

Science and Photofunctions of Flexible Response Systems with High Order

Area Organizer

Professor Masako Kato (Department of Chemistry, Faculty of Science, Hokkaido University)

What is our project "Soft Crystals"?

- Purpose of the Research Project -

This project aims to establish a new science concerning "Soft Crystals", which responds to macroscopic gentle stimuli (e.g. vapor exposure, rubbing, and rotation) that exhibit visually remarkable changes such as luminescence and optical properties. This project also aims to develop novel functional materials on the basis of the scientific achievements. "Soft Crystals" are regulated solids with stable and highly ordered structures. However, they are characteristic of facile structural transformations and phase transitions in response to weak but particular stimuli. One of scientifically most important challenges is to clarify the phenomena of the formation and phase-transition of "Soft Crystals". Through the scientific research, we aim to create a new area, which can provide new materials beyond the conventional hard crystals and/or soft matters.

Contents of the Research Project

Research Item A01: Development of Soft Crystals through molecular design & synthesis

Control of Stimulus-response and Functionalization of Luminescent Smart Soft Crystals



Masako Kato
Hokkaido University

Developments of Thermomechanical Properties of Soft Crystals



Satoshi Takamizawa
Yokohama City University

Development of stimulation-responsive soft crystal using the characteristics of silicon-silicon bond



Yoshinori Yamanoi
The University of Tokyo

Research Item A02: Development of Soft Crystals with novel structure & morphology

Mechanistic Study and Development of Novel Functions of Soft Crystals with Molecular Domino Transformation




Hajime Ito
Hokkaido University

Synthesis and Development of Chemiluminescent Soft Crystals for Spatiotemporal Control of the Stimulus-responsive Functions




Takashi Hirano
The University of Electro-Communications

Observation of Reaction Transient against External Fields in Soft Crystals using X-ray Molecular Movie



Ayana Sato-Tomita
Jichi Medical University

Development of Crystal Potential of Metal Complex and Mechanism Analysis of Polymorphic Transition Phenomena



Hitoshi Goto
Toyoashi University of Technology

Research Item A03: Development of Soft Crystals with superior physical properties & functions

Development of preparation technologies for metastable states of soft crystals and clarification of their phase-transition phenomena



Kazuyuki Ishii
The University of Tokyo

Development of luminescence properties by the manipulation of interface in Soft Crystals



Miki Hasegawa
Aoyama Gakuin University

Fabrication of Soft Photonic Crystals for Novel Functions



Jian Ping Gong
Hokkaido University

Creation of helical biopolymer-integrated softcrystal and its application to photo-electronic devices



Norihisa Kobayashi
Chiba University