

Division of Colloid and Interface Science

Term of the organization : 1/4/2018 – 31/3/2021

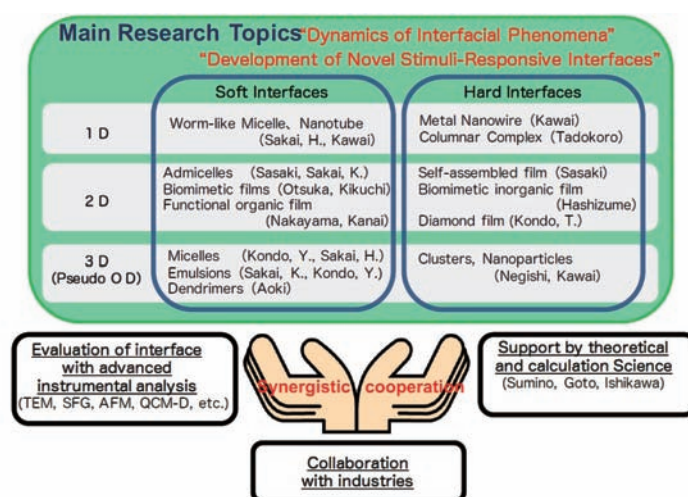
Members

(Director)	Faculty of Science and Technology • Professor	Hideki SAKAI
(Staff)	Faculty of Science • Professor	Makoto TADOKORO
	Faculty of Science • Professor	Hidenori OTSUKA
	Faculty of Science • Professor	Yuichi NEGISHI
	Faculty of Science • Junior Associate Professor	Yutaka SUMINO
	Faculty of Science • Associate Professor	Kenichi AOKI
	Faculty of Engineering, Professor	Takeshi KAWAI
	Faculty of Engineering, Professor	Yukishige KONDO
	Faculty of Engineering, Professor	Mineo HASHIDUME
	Faculty of Engineering, Professor	Hitoshi ISHIKAWA
	Faculty of Engineering, Professor	Shinya SASAKI
	Faculty of Pharmaceutical Sciences, Professor	Ryo GOTO
	Faculty of Science and Technology • Professor	Kaname KANAI
	Faculty of Science and Technology • Junior Associate Professor	Takeshi KONDO
	Faculty of Science and Technology • Junior Associate Professor	Kenichi SAKAI
	Faculty of Science and Technology • Junior Associate Professor	Yasuo NAKAYAMA
	Faculty of Industrial Science and Technology • Professor	Akihiko KIKUCHI

Objective and Future Development Goals

We restarted the division of colloid and interface science with new members from April 2018.

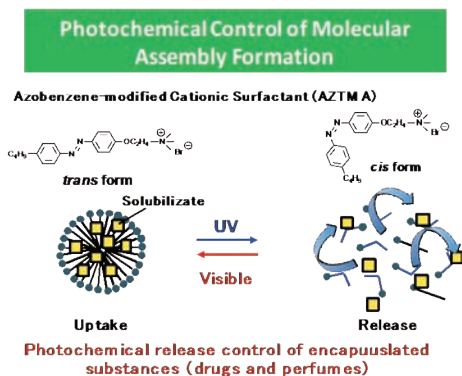
In this division, we investigate research intensively, especially focusing on “Advanced analysis of dynamic phenomena observed at various interfaces”, and “Development of novel stimuli-responsive interfaces”. Both basic and applied research are conducted effectively and synergistically by collaboration of researchers who specialize in chemistry, physics, life science, mechanical engineering, and theoretical science. Collaboration projects with industries are also promoted intensively with the aid of URA (University Research Administration Center).



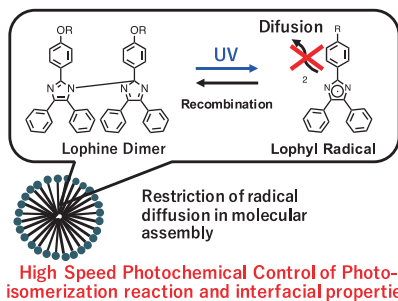
Development of "Photo-Switchable" Interface (1)

Photochemical Control of Molecular Assembly Formation

(H. Sakai, K. Sakai)



High Speed Photochemical Control of Interfacial Properties



Photochemical Control of Emulsions

(Y. Kondo, H. Ishikawa)

Enhanced Recovery of Crude Oil

Crude oils impregnated in bedrock can be recovered by surfactant solutions (Enhanced oil recovery). In order to recover oil from emulsion, efficient de-emulsification process is essential.

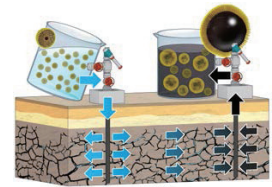
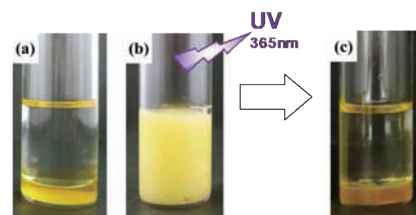


Photo-Induced Active De-Emulsification

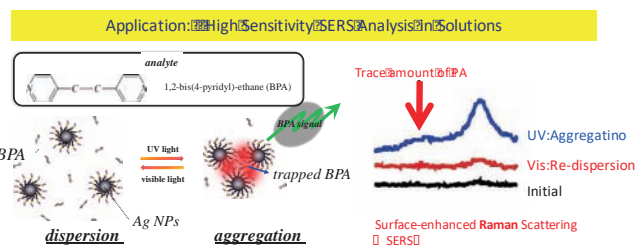
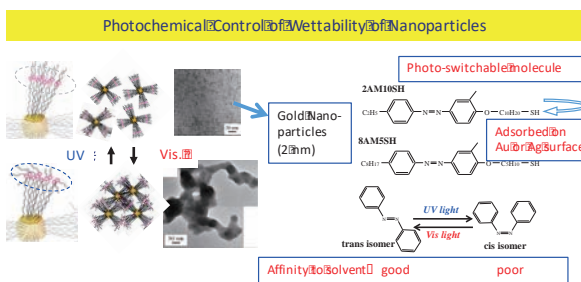


- (a) Oil and water before stirring (phase separation)
- (b) Emulsion formation by agitation
- (c) De-emulsification (phase separation) by UV light irradiation

Development of "Photo-Switchable" Interface (2)

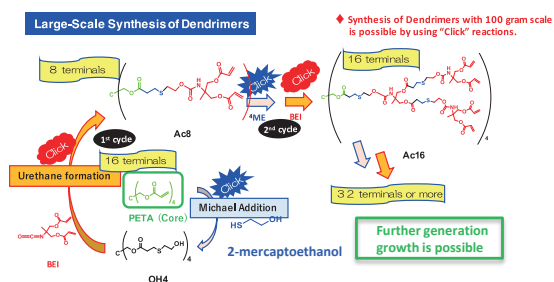
Photochemical Control of Dispersibility of Nanoparticles

(T. Kawai)

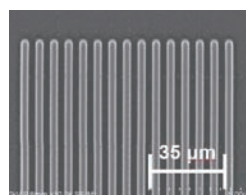


Photochemical Control of Surface Properties of Polymers

(K. Aoki)

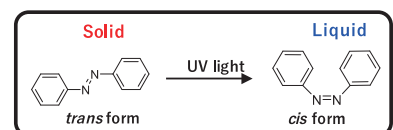


[Example 1] UV-curing Materials with high photo-sensitivity



[Example 2] Novel Adhesives using Photo-Induced Phase Transition

Dendritic Azobenzenes



Collaborations between members with different background are currently promoted