

List of Dissertation Abstract (Environment and Natural Sciences Life Sciences Course)

Name	Supervisor	Title	Abstract
Natsuko ENDO	Shinya MATSUMOTO	Examination of controlling factors in preparation of the polymorphic forms of 2,5-bis[bis(4-chlorobenzyl)amino]-3,6-dicyanopyrazine dye	The title dye exhibits crystal polymorphism with different color: yellow, yellowish orange, and red. The thermally stable yellow form is easily crystallized from several solutions, whereas it is difficult to surely crystallize the metastable yellowish- orange and red forms. The red form was frequently obtained from the mixed solution including hexane. We also found that the sample solution including hexane exhibited solvatochromism. In this presentation, the occurrence of the metastable forms will be considered on the basis of optical properties of this dye in various solvent mixtures.
Akiko KUBO	Kiyoshi HONDA	Substituent effect on intramolecular [2+2]photocycloaddition of acyclic trienes and determination of the products	Bicyclo[3.2.0]heptane skeleton is common structure in natural products some of those having biological activity. Regioselective intramolecular [2+2]photocycloaddition of 2,4,9-trienes having $\alpha,\beta,\gamma,\delta$ -unsaturated ester moiety for constructing the bicyclo[3.2.0]heptane ring system was achieved.
Yojiro KODAMA	Takashi AMEMIYA	Size-control of Gold Nanoparticles Using Hydroquinone	The purpose of our study is to control the size of gold nanoparticles by adjusting the pH and concentrations of gold ions and hydroquinone (HQ). As a result, the size of the gold nanoparticles was found to depend on the pH or the concentrations of reagents. HQ dissociates protons depending on the pH of the solution. These analysis showed that the size of gold nanoparticles is proportional to the exponentiation of the product of dissociated HQ and gold ions concentration. In this study, we can control the size of gold nanoparticles by controlling product of reagent concentration.
Shiori SHIABTA	Kazuyuki HIRATSUKA	Characterization of novel defense gene inducers based on salicylic acid quantification using bioluminescent bacteria	we aimed to construct a high-throughput system which is more convenient and capable of treating multiple samples than the conventional salicylic acid quantification method, and examined a method using multi-well plate and Arabidopsis sprouts.
Mayumi SUKAKAWA	Kiyoshi HONDA	Fluoride anion-promoted ring contraction reaction of 3-silyl-2H-1-benzopyran to 2-benzylbenzofuran	Benzofurans are used as building blocks in the synthesis of wide range of bioactive compounds. Among the enormous synthetic methods of benzofuran, the ring contraction reaction is the useful method. Herein, we report the fluoride anion-promoted ring contraction reaction of 3-silyl-2H-1-benzopyran to 2-substituted benzofuran under the mild conditions.

Kanako TACHI	Kiyoshi HONDA	Synthesis of isoxazolidine derivative and polysubstituted indane derivatives	Indane motif is basic structure which is included in natural products. I tackle synthesis of isoxazolidine derivative and polysubstituted indane derivatives.
Ryo HASEGAWA	Hiroyuki OTANI	Synthesis and Properties of the Troponoid Dyes for Dye-Sensitized Solar Cells	Tropolone is the typical examples of non-benzenoid compounds which possess pronounced aromatic character. 5-(4-N,N-dianisylamino)phenyltropolone as the D-A type dye for the solar cell element was investigated the molecular structures, the absorption behavior, the redox properties, and the photovoltaic properties. These properties were compared with 5-(4-N,N-dianisylamino)phenylthiophenyltropolone and 5-(4-N,N-dianisylamino)phenylethynyltropolone of D-p-A type dye. Furthermore, based on the comparison results of these, 5-(4-N,N-dianisylamino)phenyltropolone containing 2,5-diethynylthiophene linker, as the novel p-expanded troponoid dye, was designed and synthesized. In addition, the absorption properties in the solid state, redox behavior, and the properties as dye sensitized solar cell element of this p-expanded troponoid dye were investigated.
Sayumi HATANO	Shinya MATSUMOTO	Optical properties of 2,5-diamino-3,6-dicyanopyrazine dyes having phhenyl benzyl substituents	2,5-Diamino-3,6-dicyanopyrazine dyes have been expected to apply to organic photoluminescent materials because of their strong fluorescence in solids in addition to that in a solution state. Orange or red crystals were obtained from the derivatives having phenyl substituents at ortho or para position of the dibenzylamino groups. In this presentation, the optical properties of these two derivatives in solid state will be discussed in terms of their crystal structure obtained from single crystal X-ray structure analysis.
Takaya MINAMI	Shinya MATSUMOTO	Changes in structure and property of bisazomethine dye derivatives by temperature change or solvation	A bisazomethine dye having diethylamino groups undergoes a structural phase transition accompanying the change of lattice size in a high temperature region and at the same time exhibits a dynamic behavior. In the case of the dipropylamino derivative, the crystal color varies depending on the presence or absence of the solvent in the crystal, and the color reversibly changes by heating, solvent immersion and vapor exposure.
Yu KAWAKITA	Takashi AMEMIYA	Study of microbial interactions by analyzing oscillations synchrony in glycolytic pathway	In yeast cells, the concentrations of metabolites in glycolytic pathway are known to oscillate under some conditions. In yeast populations, these glycolytic oscillations are known to synchronize by the concentrations of acetaldehyde and so on. It is expected that the synchronization of glycolytic oscillations exhibits microbial interactions in metabolism. We quantified this interactions.

Yichen DU	Takashi AMEMIYA	Analysis of Glycolytic oscillations and synchronization by a mathematical model	In this study, we have created a new glycolysis model based on three variables. The population behavior of the cells is studied by simulations. Our results demonstrate that synchronicity depends on membrane permeability and cell density, the mechanism of Spatio-temporal pattern has been investigated.
-----------	--------------------	---	---