

List of Dissertation Abstract (Environment and Natural Sciences)

Name	Supervisor	Title	Abstract
In-Sub Shin	Shinya MATSUMOTO	Study on the photoreaction of 2,5-bis(dibenzylamino)-3,6-dichloro- <i>p</i> -benzoquinone and its reaction products.	Photo-reactive organic dyes have attracted much attention as a new class of functional materials towards various applications. The benzyl groups of 2,5-bis(dibenzylamino)-3,6-dichloro- <i>p</i> -benzoquinone (1) were found to be easily eliminated under ambient light conditions. In this study, a plausible reaction pathway of this photoinduced debenzylation of 1 was demonstrated on the basis of the determination of new reaction products as well as the trace of the reaction using various analytical techniques under different experimental conditions. This study also included the reaction of 1 in the solid state and polymorphism of a reaction product.
Kenji IKUNO	Ryoji WANI	Taxonomy of the genus <i>Polyptychoceras</i> (Ammonoidea: Diplomoceratidae) from the northern Pacific realm	The genus <i>Polyptychoceras</i> is a heteromorph ammonoid that flourished in the northern Pacific realm in the Late Cretaceous. In this dissertation, the taxonomy of <i>Polyptychoceras</i> was studied using nomenclatural, morphological, and stratigraphical approaches. The nomenclatural review revealed the nomenclatural statuses of hitherto proposed names. The species diversity of <i>Polyptychoceras</i> from Hokkaido, Sakhalin, and Vancouver was clarified through the observation of shell morphology. This genus was subdividable to two groups based on the characteristics of the shell surface ornamentation.
Naoya OHTSUKA	Kiyoshi HONDA	Development of self-propagative Lossen rearrangement and synthesis of chiral hydroxamic acid ligands.	Hydroxamic acids are found in natural products and bioactive compounds. Recently, the reactivity and property of hydroxamic acids have attracted the attention in the research field of organic synthesis. In this paper, we developed base-mediated self propagative Lossen rearrangement to obtain primary amines, and design and synthesis of novel chiral cyclic hydroxamic acids.

Kenta TANAKA	Kiyoshi HONDA	Development of pericyclic reaction for environmental loading reduction	The clean organic synthesis using "organic catalyst", "low temperature conditions", "visible light" has been developed. In particular, facile organophotoredox catalysts efficiently proceed the reaction under green light or sun light. This study provides a sustainable synthetic process for reduction of environmental load.
Yumiko TSUBOKAWA	Masahiro ISHIKAWA	Sintering of polycrystalline clinopyroxene and polycrystalline olivine and ultrasonic velocity measurements under high P-T conditions	Fine-grained polycrystalline clinopyroxene and polycrystalline olivine were successfully sintered from nano-sized powders of minerals. P and S wave velocities (V_p and V_s , respectively) of polycrystalline clinopyroxene are determined at high temperature and high pressure conditions. At room temperature, V_p , V_s and V_p/V_s increased during pressurization. On the other hand, at 1.0 GPa, V_p and V_s decreased and V_p/V_s slightly increased with increasing temperature. The elastic constants of polycrystalline clinopyroxene with grain size of submicron scale obtained in this study are smaller than previously published data.
Yukiko NAGAI	Ryoji WANI	Reading the fine print: Ultra-microstructures of foraminiferal calcification	Foraminifera are marine unicellular protists. Foraminiferal fossils have been found since the early Cambrian. It has been shown that the foraminiferal test changes its morphology and chemical composition to a certain extent, depending on the environment. For this reason, foraminifera is broadly used for paleoenvironmental study. However, calcification process of the foraminifera is not fully understood yet. This study has observed cellular activities and ultra-microstructures with time-series samples of shell formation to reveal the detailed foraminiferal calcification process.