Visiting Professors

Visiting Professor
KITAGAWA, Hiroshi *(from Kyushu University)*

Creation of Novel Functional Nano Materials Based on Proton-Coupled Electronic Properties

Dynamics of molecules and ions in "coordination nano-space" are acted by characteristic nano-fields such as intermolecular interaction, coulomb interaction, catalytic action, *etc*. This project is to reveal a basic principle of an unusual nano-field acting on coordination space, and to create the nano space where the energy conversions can be easily operated. In particular, we aim at the construction of coordination nano space system which is able to control a series of energy operations such as generation, separation, storage, material conversion of an energy molecule H_2, or electron/ion transport. In this year, we have explored a novel hydrogen-energy functional coordination nano-space by using proton-coupled redox and electron-proton interaction. In the present project, we will create new 1) hydrogen-storage nano-materials, 2) highly proton-conductive coordinatiom polymers, 3) highly electron-proton conductive matrerials, *etc*.

Visiting Associate Professor
KANAMORI-KATAYAMA, Mutsumi *(from RIKEN)*

Development of the Assay System for Protein-RNA Interactions

Recently, it has been cleared that a large amount of non-coding RNA (ncRNA) existed in mammalian cells. Though some ncRNAs are analyzed and cleared to have important functions, what most ncRNAs do is largely unknown. These ncRNAs are thought to function with Protein, RNA or DNA rather than by themselves. Therefore, it is thought that the information of interactions will play an important role to annotate the function of ncRNAs.

So, we focused on the protein-RNA interaction (PRI), and have been developing the assay system to obtain PRI information efficiently.

Visiting Associate Professor
KONDO, Mitsuru *(from Shizuoka University)*

Synthesis of Coordination Polymers with Metallocene Units

Network materials obtained by connections of metallocene units with organic components have attracted intense attentions toward the developments of new functional materials because of the high redox properties and versatile flexibilities based on the metallocene units. Nevertheless, assembled materials with metallocene units excepting ferrocene moieties are still limited. We have prepared the coordination polyerms with cobaltocene and rhodocene units. Reccently, we have selected ruthenocene-1,1'-dicarbocxylic acid (H_2rudc) toward creations of new network materials with ruthenocene units, and have succeeded in syntheses and characterizations of two new network materials, (dpe)(H_2rudc) (dpe = bipyridylethyelene) (**1**) and (Hdpp)(Hrudc) (dpp = dipyridylpropane) (**2**). The effects of the free rotations of the Cp rings on the network structures have been shown by their structural characterizations. That is, although both compounds **1** and **2** give linear networks constructed by intermolecular hydrogen bonds, compound **2** demonstrates a quite unique folding structure compared to the simple linear structure of **1**.