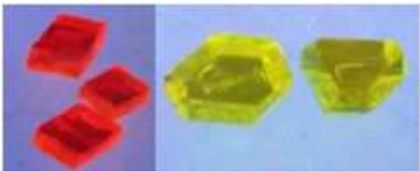


| Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Job Title | Area of Expertise |
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| SAKUDA Eri                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Professor | Photochemistry    |
| <b>1. Main Research Topics</b><br><br><b>① Synthesis and Photophysical Properties of photofunctional compounds using main group elements</b><br><br><p>This study focuses on the creation of luminescent compounds by skillfully utilizing the characteristic excited-states of typical elements. For example, when organic compounds bridged by boron atoms are crystallized in various solvents, different crystal forms are obtained. By investigating the correlation between crystal systems/structures and luminescence, we were able to clarify the relationship between the boron environment and its luminescent properties (Figure 1).</p> <p>Furthermore, the creation of luminescent complexes with substituent sites on the typical elements that exhibit different emission colors based on the surrounding environment was also investigated, along with their luminescent characteristics (Figure 2). Such luminescent compounds can be utilized in devices such as organic light-emitting diodes (OLEDs). Moreover, because their emission color is highly sensitive to environmental changes, these compounds hold promise for use as environmental-responsive sensors.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p><b>Figure 1:</b> Examples of compounds whose emission color changes depending on the crystal system.</p> </div> <div style="text-align: center;">  <p><b>Figure 2.</b> Example of a compound showing emission color change depending on solvent polarity</p> </div> </div><br><br><b>② Construction of energy conversion systems by utilizing the main group elements</b><br><br><p>In this study, we are also attempting to convert carbon dioxide into a valuable carbon resource by utilizing the excitation energy of compounds containing main-group elements and metal complexes. Most of the CO<sub>2</sub> photoreduction catalysts reported so far rely on rare metals, which pose challenges in terms of cost and resource scarcity. Therefore, the development of a CO<sub>2</sub> photoreduction system that utilizes main-group elements instead of expensive metals could contribute to the construction of a new artificial photosynthetic system that does not depend on rare metals.</p> |           |                   |
| <b>2. Keywords</b><br><br>Photochemistry, Main group element, Metal complex, Energy conversion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |                   |
| <b>3. Remarks and Websites</b><br><br><b>researchmap</b> : <a href="https://researchmap.jp/sakueri">https://researchmap.jp/sakueri</a><br><b>Laboratory</b> : <a href="https://www.cms.nagasaki-u.ac.jp/lab/sakutai/">https://www.cms.nagasaki-u.ac.jp/lab/sakutai/</a><br><b>Dynamic Exciton:Emerging Science and Innovation</b> : <a href="https://dynamic-exciton.jp/">https://dynamic-exciton.jp/</a><br><br>In Research Project 1, the luminescent materials are expected to be applicable to displays and organic electroluminescent (EL) devices. In addition, their use as environmentally responsive sensors and in vivo probes is also envisioned. Meanwhile, Research Project 2 holds promise for applications in artificial photosynthesis systems and the development of systems that convert carbon dioxide into valuable carbon resources.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                   |