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Preface

This special issue represents a collection of the papers presented at the 18th International Symposium on the Photochemistry and Photophysics of Coordination Compounds (ISPPCC) held in Sapporo, Japan from July 4 to July 9, 2009. This is the second time for Japan to host the ISPPCC meeting; the earlier conference, organized by Takeshi Ohno, was held in 1993 in Sendai (10th ISPPCC).

The first ISPPCC was held in Muhlheim, Germany in 1974 and has continued on a biannual basis since then. The meeting has made a tradition of having a single session in one conference room, with one or more poster sessions during the week of the conference. The emphasis has always been on an in-depth discussion of the photochemistry and photophysics of inorganic compounds. The major topics of the conferences have changed over time; in early meetings, a main player was the photochemistry of chromium complexes, which was replaced by 2nd and 3rd row transition metal complexes such as the tris(bipyridine)ruthenium(II) dication, $[Ru(bpy)_3]^{2+}$, and tricarbonylchloro(bipyridine)rhenium, $[Re(bpy)(CO)_3Cl]$. In the early 70s, the first oil crisis brought us the sudden increase in oil prices and forced us to investigate a change of our energy source from oil to others such as solar or efficient electricity usage in order to alter society's reliance on oil. This inspired the discovery of new inorganic materials such as photocatalytic TiO_2, and gave rise to many important concepts for understanding the behavior of photoexcited states. For example, thorough studies of photoinduced electron and energy transfer processes of $[Ru(bpy)_3]^{2+}$ the understanding of electron transfer energetics based on excited state redox potentials became clear, as predicted by Marcus theory. More recently, dye-sensitized Grätzel-type solar cells have been fabricated. These subjects have been deeply discussed in the past ISPPCC meetings. Despite the decrease in public interest and support for energy related research in the 1980s and 1990s, the photochemistry of inorganic complexes has continued to be actively studied and discussed in the past ISPPCC meetings.

Since the photochemical properties of ruthenium and rhenium complexes have been recognized to be suitable for a molecular unit, the development of photofunctional molecular devices, based on supramolecular chemistry became an attractive area, and the topics became diverse, as reflected the programs of the last three ISPPCC meetings. Very recently public concern about how to establish an environmentally friendly sustainable society to prevent global warming and tackle the energy crisis, has stimulated a revival of interest in alternative energy sources such as solar energy, and this interest is more serious than in the 70s and 80s. The previous ISPPCC meeting in Dublin, organized by Prof. J.G. Vos, emphasized this point, and made the discussion public, which promoted tremendous interest in this field. Considering the overwhelming demand from the society, what should we do for the next generation in this inorganic photochemistry field?

It is obvious that the recent rapid growing interests in solar energy conversion and storage, and organic light-emitting diode (OLED) devices create a need to search new functional materials and discuss the basic science and technical and scientific problems associated with these areas. During the 18th ISPPCC meeting, the topics of solar fuel production (water oxidation and reduction) by using homogeneous and heterogeneous photocatalysts were actively discussed. Without deep understanding of the basic photochemistry and photophysics of inorganic compounds, the development of these fields may never be accomplished. Recently, many $[Ru(bpy)_3]^{2+}$ and $[Ir(ppy)_3]$ derivatives have been synthesized and spectroscopically examined. However, in reporting this work, different quantum yield values have been used for references, even for $[Ru(bpy)_3]^{2+}$. Therefore, for the resulting quantum yield values, the comparison between different researchers' data is sometimes not straightforward. As a result, the local organizing committee decided to ask Prof. K. Nozaki to organize a topical session on "recent advances in instrumentation for emission quantum yield measurements". The summary was included in the special issue, which provides a new standard for the reference compounds for emission and emission quantum yield measurements in inorganic complexes including lanthanide complexes.

The symposium was attended by 287 participants from 19 countries, and the program consisted of 70 oral presentations including two plenary lectures and 158 posters, covering a wide range of luminescent metal complexes, including Re(I), Ru(II), Ir(III), Cu(I), Pt(II), Rh(I), Fe(II), Ag(I), Au(I), Cr(III), Os(II), and lanthanides such as Eu(III) (see the scientific program in the website: http://wwwchem.sci.hokudai.ac.jp/isppcc2009/). These luminescent inorganic complexes have been studied for targeting a variety of applications including bio-sensors, solar fuel production (such as water oxidation and reduction), and OLED devices, which became a trend in recent ISPPCC meetings.

Finally, the members of the organizing committee would like to thank the corporate sponsors of the 18th ISPPCC and also the several foundations (see the list: http://wwwchem.sci.hokudai.ac.jp/isppcc2009/page13.htm).

The 19th International Symposium of the Photochemistry and Photophysics of Coordination Compounds will be held in July 3–7, 2011, Strasbourg, France (further information in the following website: http://isppcc-2011.unistra.fr/index.php?m=0).

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18th ISPPCC participants at the excursion of Mt. Showashinzan, July 7, 2009.

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