トリフェニルアルシンを用いた強発光性銅(I)配位高分子の発光特性

（京工繊大院工芸）○菊池 一槙・井本 裕顕・中 建介

Luminescent Properties of Strongly Emissive Copper(I) Coordination Polymers with Triphenylarsine (*Graduate School of Science and Technology, Kyoto Institute of Technology*)
○Kazuma Kikuchi, Hiroaki Imoto, Kensuke Naka

Luminescent copper(I) complexes have a variety of supramolecular architectures and luminescent properties[1]. In this work, 1D-coordination polymers with dinuclear rhombic $\{Cu_2X_2\}$ cores (X = Br, I) were easily synthesized by spontaneous evaporation method, using triphenylarsine ($AsPh_3$) and a series of bidentate *N*-heteroaromatic co-ligands (**Figure 1. (a), (b)**). Some of the coordination polymers in this work exhibited strong phosphorescence even at room temperature (Φ_{PL} : up to **0.95**), and the emission color was dependent on the *N*-heteroaromatic co-ligand. The emission efficiencies of the coordination polymers were stronger than those of the discrete ones that were reported in our previous work[2]. In addition, the luminescence of the coordination polymers was more resistant to mechanical stimuli unlikely to the discrete ones. Interestingly, coordination polymer $[Cu_2X_2(AsPh_3)_2(2\text{-methylpyrazine})]_n$ was converted to discrete complex $Cu_2X_2(AsPh_3)_2(2\text{-methylpyrazine})_2$, and the emission color was drastically changed when the ligand vapor exposed (**Figure 1. (c)**).

Keywords *: coordination polymer, arsine, copper, luminescent property, chromic property*

発光性銅(I)錯体は多様な超分子構造や発光特性をもつことで知られている[1]。本研究ではトリフェニルアルシン($AsPh_3$)と種々の架橋性 *N*-ヘテロ芳香族配位子を用いて、自然蒸発法により、二核菱形の$\{Cu_2X_2\}$ユニット(X = Br, I)をもつ１次元鎖の配位高分子を合成した(**Figure 1. (a), (b)**)。合成した錯体のいくつかは室温でも強い燐光発光を示し(Φ_{PL}： up to **0.95**)、その発光色は用いた共配位子の種類によって変化した。また類似の孤立した低分子錯体[2]の結果と比較して、構造の剛直性に伴い発光強度が向上した。さらに興味深いことに、2-メチルピラジン(meprz)を共配位子として用いた配位高分子($[Cu_2X_2(AsPh_3)_2(meprz)]_n$)について、過剰量の配位子蒸気に曝すことで低分子錯体($Cu_2X_2(AsPh_3)_2(meprz)_2$)へと錯体構造が変化し、かつその発光色が大きく変化することが分かった(**Figure 1. (c)**)。

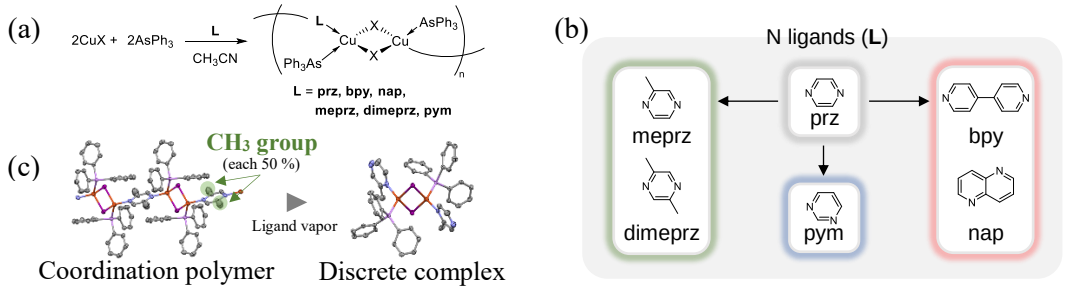

Figure 1. (a) Synthetic route, (b) bidentate co-ligands, and (c) specific change in this study.

1) J. Troyano, F. Zamora, S.Delgado, *Chem. Soc. Rev*. **2021**, *50*, 4606-4628.
2) R. Kobayashi, H. Imoto, K. Naka, *Eur. J. Inorg. Chem.* **2020**, *37*, 3548-3553.