

Synthesis and Conjugated Polymerization of Hypervalent Tin Compound Based on Azobenzene Dinuclear Ligand

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π -Conjugated molecules have excellent electronic properties which can be tuned by structural modification, and they have been used in a variety of fields, such as OLEDs and OPVs. Recently, the introduction of heteroatoms into π -conjugated frameworks to impart functionality has attracted attention. Molecules whose electronic states change in response to external stimuli are expected to be applied to sensing materials. Heavy main group elements can form hypervalent state where the number of valence electrons formally exceeds the octet rule, and they can take on a variety of coordination numbers. We have reported on hypervalent tin compounds using azobenzene tridentate ligands^[1]. The hypervalent tin compounds can change their electronic states of π -conjugated scaffolds depending on the coordination number of tin atom. In this study, we focused on the two coordination points involved in azobenzene. We synthesized dinuclear hypervalent tin compounds in which two tin atoms are introduced into a single azobenzene ligand and carried out conjugated polymerization using the dinuclear compound as a monomer (Figure 1).

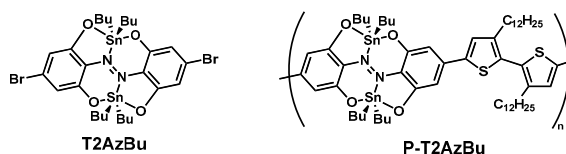


Figure 1. Dinuclear hypervalent tin compound.

Optical measurements showed that the absorption spectra of **T2AzBu** changed in accordance with addition of the coordination solvent, dimethyl sulfoxide (DMSO), as previous research (Figure 2)^[1]. The results suggest that two Lewis bases coordinate to the hypervalent tin compound owing to the dinucleation. In this presentation, we will discuss the changes in the electronic states of dinuclear compounds depending on the change in the coordination number.

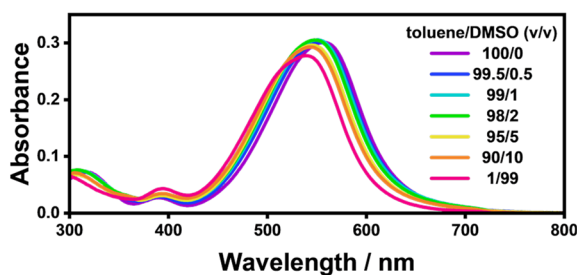


Figure 2. Absorption spectra of **T2AzBu** in each solvent volume ratio (1.0×10^{-5} M).

[1] Gon, M.; Tanaka, K.; Chujo, Y. *Chem. Eur J.* **2021**, *27*, 7561–7571.