Creation of Novel Luminescent Polymers Based on Boron-fused Azomethine Complexes

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Organic dyes have attracted attention for the development of low cost and flexible optoelectronic devices. However, common organic dyes show weak luminescence in the solid state because the rigid and planar conjugated backbones facilitate the formation of aggregates in solid states. Such molecular aggregations often cause aggregation-caused quenching (ACQ) behaviors through strong intermolecular interactions.

Recently, we found that boron-fused azomethine (BAm) complexes had crystallization-induced emission enhancement (CIEE) properties.[1] Moreover, we also found that the conjugated polymers containing BAm complexes showed intense emission in the film states.[2] BAm can be candidate for a new solid luminescent backbone for devices.

In this study, we synthesized a new series of BAm compounds, **N-BAm**. Optical measurements of **NH-BAmPh** (Figure 2, left) revealed that the emission showed red shift compared to previous BAm compounds. Moreover, we also synthesized conjugated polymers containing **N-BAm** in the main chain (Figure 2, right), which showed a different emission behavior from the previous ones.

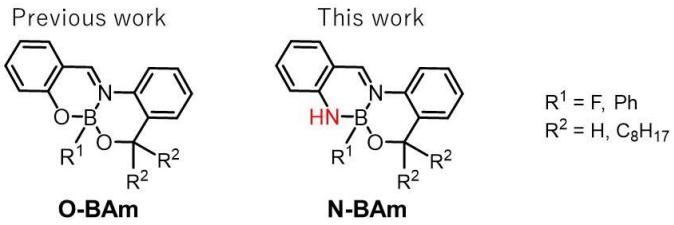

Figure 1. Chemical structures of **O-BAm** and **N-BAm** groups.

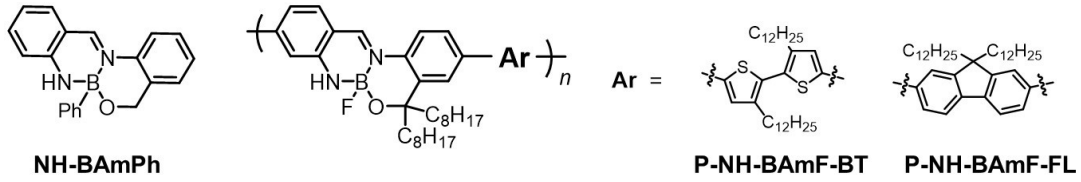

Figure 2. Chemical structures of synthesized **NH-BAm** compounds.

1) Ohtani, S.; Gon, M.; Tanaka, K.; Chujo, Y. *Chem. Eur. J.* **2017**, *23*, 11827–11833.
2) Ohtani, S.; Gon, M.; Tanaka, K.; Chujo, Y. *Macromolecules* **2019**, *52*, 3387–3393.