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第270回 ISITマテリアルズ・オープン・ラボセミナー
第337回 未来化学創造センターセミナー

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# N,O-Coordinated Boron Difluoride Complexes for Organic Lasers and OLEDs


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Boron difluoride (BF2) complexes have emerged as a promising class of functional organic materials due to their favorable photophysical properties, structural tunability, and high thermal stability. Herein, we report the design, synthesis, and comprehensive characterization of a series of benzochalcogenazole-based N,O-coordinated BF2 complexes engineered for optoelectronic applications. The materials exhibit pronounced aggregation-induced emission (AIE) and strong solid-state luminescence, with photoluminescence quantum yields of up to 48% in the crystalline state. They also display amplified spontaneous emission (ASE) with thresholds as low as 4.7 μJ × cm-2, enabling efficient organic solid-state laser (OSSL) operation. Meanwhile, benzothiazole- and benzoselenazole-containing compounds exhibit both prompt fluorescence and efficient thermally activated delayed fluorescence (TADF).  Organic light emitting diodes (OLEDs) incorporating these emitters demonstrate efficient energy conversion and bright electroluminescence.


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