

EXPLORING AGGREGATION-INDUCED EMISSION IN ZINC (II)
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Aggregation-Induced Emission (AIE) is a fascinating phenomenon in which certain molecules exhibit enhanced fluorescence emission when they aggregate or undergo molecular packing in a condensed phase, such as a solid or concentrated solution [1]. In this study, our focus lies in the investigation of AIE within the context of coordination complexes, specifically involving two ligands L_1 and L_2 , as well as their zinc (II) complexes ZnL_1 and ZnL_2 .

We synthesized two analogous ligands incorporating 2,6-bis(pyrazol-1-yl)pyridine (bpp) and benzothiophene unit connected either by a single bond (L_1) or by the vinyl bridge (L_2). Following this, mononuclear complexes (ZnL_1 and ZnL_2) were synthesized by coordinating Zinc (II) ion with the corresponding ligands.

Remarkably, the ligands L_1 and L_2 do not exhibit the AIE effect, nor does the complex ZnL_1 . However, complex ZnL_2 demonstrates pronounced AIE behavior, a characteristic rarely seen when the ligands themselves lack this phenomenon.

Our comprehensive studies, including UV-vis absorption and emission spectroscopies in solution and the solid state, offer valuable insights into the AIE properties of complex ZnL_2 . Additionally, we explored the fluorescence behavior of ZnL_2 in solvents with varying ratios of water and ACN, revealing optimal conditions for AIE enhancement (Figure 1). Furthermore, we present X-Ray structural data for complex ZnL_2 .

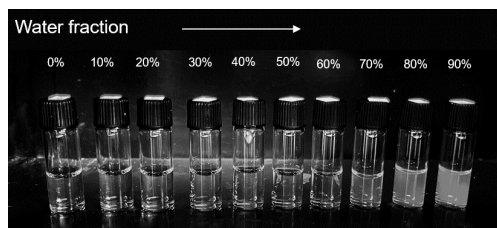


Fig. 1. The fluorescence photographs under UV light of 10^{-5} M ZnL_2 in mixed solvent of water and ACN system with different water fractions

In summary, the unique structural features of ZnL_2 , including the presence of vinyl bridge play a pivotal role in the AIE effect, differentiating it from the ligands L_1 and L_2 , as well as ZnL_1 . This research provides valuable insights into the photophysical properties of coordination complexes and their potential applications in various fields.

1. Ju Mei, Nelson L. C. Leung, Ryan T. K. Kwok, Jacky W. Y. Lam, and Ben Zhong Tang, *Chem. Rev.* **2015**, *115*(21), 11718.