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A single-state fluorescent with bright white-light emission in the solid state and aggregation-induced emission enhancement compound for Pd⁰ detection

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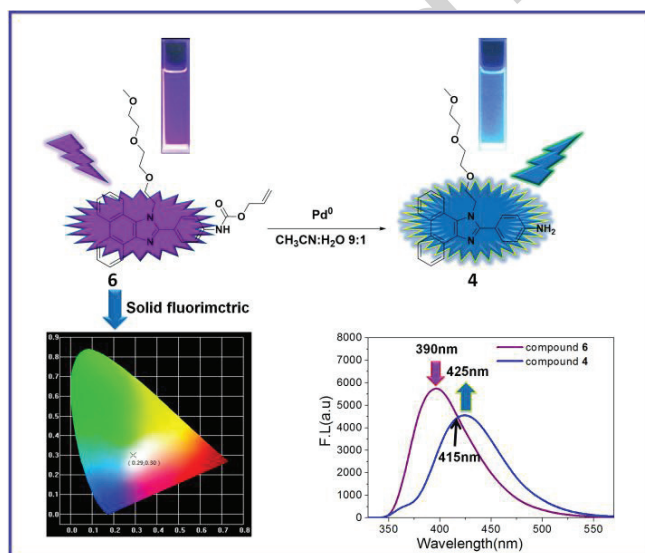
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ABSTRACT

A single-state molecule compound with phenanthrene-imidazole as fluorescent core was synthesized. The compound emitted white light in solid state and exhibited aggregation induced emission enhancement (AIEE) characteristic in solution state. From photophysical properties, it was presumably that π - π stacking caused by the excimer, which generated between solid molecules, led to the emitting white light. In addition, in the solution state, with the increasing fraction of the poor solvent, the rotation of the compound molecule was inhibited, which led to the luminescence enhancement induced by aggregation. In the aspect of Pd⁰ response, compound **6** had a sensitive detection of Pd⁰. The bathochromic shift of emission peak from around 390 nm to around 425 nm and remained saturated within 30 minutes. Compound **6** was stable at pH of 6 - 9 and the detection limit for metallic palladium was as low as 2.7 nM.

Graphical Abstract



Keywords: Phenanthrene-imidazole, Ratiometric, Fluorescence, Pd⁰, White light

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