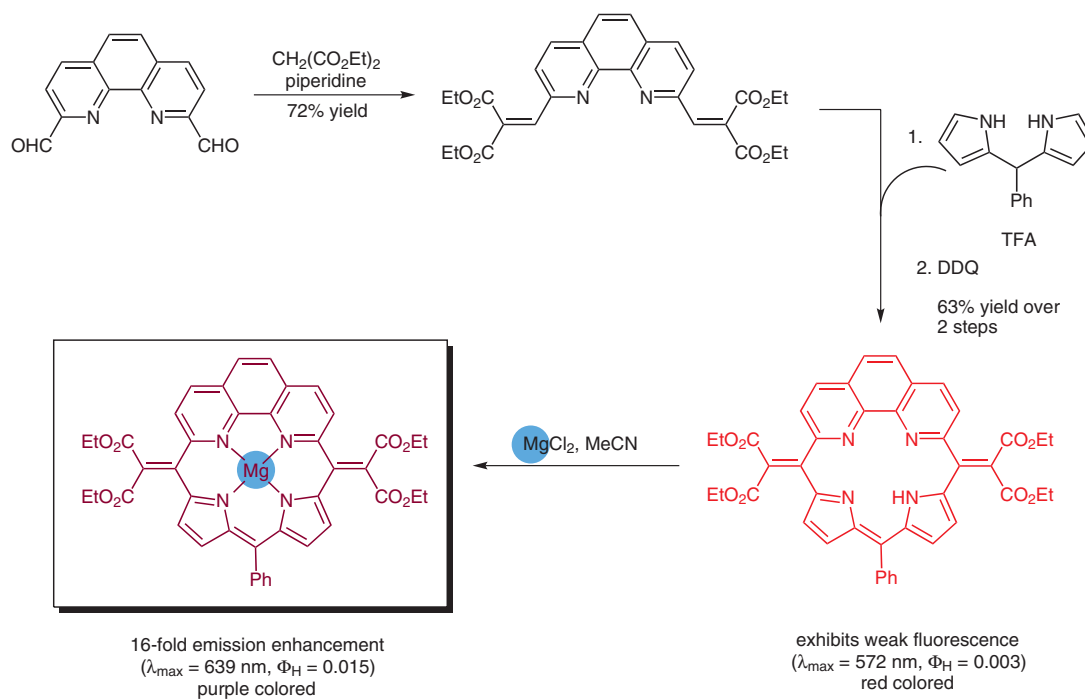


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A Porphyrin-Related Macrocycle with an Embedded 1,10-Phenanthroline Moiety: Fluorescent Magnesium(II) Ion Sensor

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Phenanthroline–Porphyrin Hybrid as a Fluorescence Sensor for Magnesium(II)



Significance: The selective detection of magnesium ions in the presence of sodium, potassium and calcium is particularly important in elucidating biological processes. Porphyrins and their derivatives possess both a far-red fluorophore and a binding domain for sensing. Unfortunately, porphyrins almost exclusively sense anions. The authors demonstrate that the novel 1,10-phenanthroline-phenyldipyrromethane hybrid macrocycle can effectively bind magnesium cations. Upon binding, the macrocycle undergoes a red shift as well as a 16-fold enhancement in emission intensity. The binding studies were also performed in an aqueous medium to demonstrate applicability for biological systems.

Comment: The currently available molecular fluorescent probes for magnesium suffer from other cation interference. The authors demonstrate that this novel macrocycle binds calcium very weakly and effectively not at all sodium or potassium.

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