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Full Paper

锌离子选择性化学传感器的设计与合成

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摘要 设计合成了带有羟基取代的希夫碱配体化合物1，
并研究了它与Zn^{2+}的识别。结果发现：在乙腈溶剂中化合物1与Zn^{2+}络合后有强的荧光发射，而化合物1
除了与Mg^{2+}络合后有弱的荧光发射被检测到外，与其他离子(Fe^{2+},

Co^{2+}, Ni^{2+}, Cu^{2+}, Cd^{2+}, Hg^{2+},

Pb^{2+}, Ca^{2+}, Ba^{2+}, Sr^{2+})络合后未检测到荧光发射。研究结果还表明：化合物1
能在多组分混合离子中对Zn^{2+}进行选择性检测而不受其他离子的干扰。为了弄清配体化合物1
与Zn^{2+}络合的反应机理，本论文还设计合成了其他三个带羟基取代的希夫碱配体化合物2-4，
并分别研究了它们与Zn^{2+}的识别。

关键词 化学传感器,希夫碱,荧光,锌离子
分类号

Design and Synthesis of a Selective Chemosensor for Zn^{2+}

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Abstract A hydroxyl substituted phenolic Schiff base **1**, used as sensor for detection of Zn^{2+}, was synthesized and investigated. It was found that a strong fluorescence emission was observed when **1** bound to Zn^{2+} in acetonitrile, whereas no fluorescence emission was detected when **1** bound to other metal ions (Fe^{2+}, Co^{2+}, Ni^{2+}, Cu^{2+}, Cd^{2+}, Hg^{2+}, Mg^{2+}, Pb^{2+}, Ca^{2+}, Ba^{2+}, Sr^{2+}) except for Mg^{2+}, for which a weak fluorescence emission was detected in the same condition. Competition experiment showed that no obvious interference was observed in its fluorescence while **1** performed the titration with Zn^{2+} in the different mixtures of metal ions. To understand the site where Zn^{2+} coordinated to the ligand and the mechanism of binding, three other hydroxyl substituted phenolic Schiff bases **2—4** were synthesized and their binding reactions with Zn^{2+} were also investigated.

Key words chemosensor Schiff base fluorescence Zn^{2+}

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