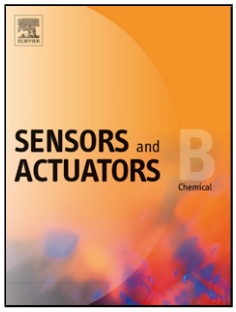

Title: Two Schiff-base fluorescence probes based on triazole and benzotriazole for selective detection of Zn2+

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Highlights

1. Two turn-on Schiff-base fluorescent probes based on triazole, benzotriazole were designed and synthesized.
2. Materials is low cost and easily-prepared.
3. Theoretical calculations showed compounds are good fluorescent materials.
4. The fluorescence probes exhibited excellent sensitivity and selectivity for Zn^{2+}.

Two Schiff-base fluorescence probes based on triazole and benzotriazole for selective detection of Zn^{2+}

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Abstract: Two novel Schiff-base fluorescence probes based on triazole and benzotriazole were designed and synthesized. Corresponding orbital electron distribution and molecular geometry configurations of the compounds were predicted by density functional theory (DFT). Fluorescence properties of probes were detected by UV-vis and fluorescence spectra. Test results indicated that the probes had specific selectivity and high sensitivity for Zn^{2+} compared with metal ions examined (Ag^{+}, Al^{3+}, Cd^{2+}, Cu^{2+}, Fe^{3+}, Hg^{2+}, K^{+} and Pb^{2+}). In addition, the detection limit of the probes toward Zn^{2+} was low down 10^{-9} M. Therefore, the probes should be potential application in both the environment and biological systems for the detecting of Zn^{2+}.

Key words: fluorescence probes, triazole, benzotriazole, Schiff-base

Introduction

Zinc is an important essential trace element（10 to 15 mg each day）in the human body. Many researchers reveal that Zn^{2+} plays a vital role in biological and metabolic function, including regulate catalytic activity of enzymes, neurotransmission, cellular transport, and apoptosis [1-3]. Moreover, Alzheimer´s diseases, Parkinson´s diseases, epilepsy and Ehlers-Danlos syndrome [4-6] are caused by deviation of Zn^{2+} concentrations in vivo biology. Excess of Zn^{2+} can also cause great damage to human health and environment. Therefore, it is of essential for people to find a simple and accurate method to detect the concentrations of Zn^{2+} in both the biological systems