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Design and synthesis of a novel fluorescent-colorimetric chemosensor for selective detection of Zn(II) and Cu(II) ions with applications in live cell imaging and molecular logic gate

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Abstract

We present here the synthesis of a simple and low-cost Schiff base chemosensor (**HL**) for selective detection of both Zn(II) and Cu (II) in HEPES buffer pH=7.4. The chemosensor **HL** exhibits quick response through fluorescence and colorimetric changes for both Zn(II) and Cu (II) ions as examined by fluorescence and absorption titrations. Both the metal ions form 1:1 L– Zn(II) (complex **1**) and 1:1 L– Cu(II) (complex **2**) complexes, confirmed by Job's Plot. We are successful to elucidate the structure of complex **1** through X-ray diffraction analysis. Reversibility of the chemosensor in its binding with Zn(II) and Cu (II) ions separately is also examined in presence of Na₂EDTA solution. The enhancement of fluorescence intensity of the chemosensor is based on the chelation-enhanced fluorescence (CHEF) effect of L–Zn(II) with

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