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Synthesis and application of a highly selective copper ions fluorescent probe based on the coumarin group

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Abstract

A highly selective copper ions fluorescent probe based on the coumarin-type Schiff base derivative **1** (probe) was produced by condensation reaction between coumarin carbohydrazide and 1H-indazole-3-carbaldehyde. The UV-vis spectroscopy showed that the maximum absorption peak of compound **1** appeared at 439 nm. In the presence of Cu²⁺ ions, the maximum peak decreased remarkably compared with other physiological important metal ions and a new absorption peak at 500 nm appeared. The job's plot experiments showed that complexes of 1:2 binding mode were formed in CH₃CN:HEPES (3:2, v/v) solution. Compound **1** exhibited a strong blue fluorescence. Upon addition of copper ions, the fluorescence gradually decreased and reached a plateau with the fluorescence quenching rate up to 98.73%. The detection limit for Cu²⁺ ions was estimated to 0.384 ppm. Fluorescent

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