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Detection and application of heavy metal ions in environment and biological cell imaging based on fluorescence probe testing technology

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During recent decades, Fluorescence sensing using small molecule probes has been one of the most powerful and popular tools to help us monitor and visualize amounts of samples in a biological system because of their simplicity, high sensitivity, as well as excellent spatiotemporal resolution. Aluminum ion is an essential trace prevalent element, an excessive amount of aluminum in the human body could be believed to cause health issues. We reported herein the design, synthesis, and environmental, biological evaluations of a novel bipyridine fluorescence sensor is used to recognize aluminum ions, which is induced by Al³⁺ lead to a highly selective fluorescence “turn-on” response toward Al³⁺ over other metal ions with micromolar sensitivity. The 1:1 stoichiometric structure between RhBD and Al³⁺ were supported through Job's plot, ¹H NMR, FTIR, ESI-MS. The analytical results obtained through UV-vis and fluorescence spectrophotometry display that linear range and the limit the detection (LOD) of the present sensor for Al³⁺ are 0.8~70 μM and 0.33×10⁻⁷ M, respectively. The present probe was used to the detection of Al³⁺ in drinking water with the recoveries ranging from 99.2 to 100.7%, and fluorescence imaging for living HeLa cells.

Biography

Gang Zhao is a PhD candidate in the state key laboratory for modification of chemical fibers and polymer materials, college of materials science and engineering, Donghua University, Shanghai, China. Her main research direction investigated the organic-inorganic nanohybrid fluorescence chemosensor, and used to environmental and biological sample, in addition, which can trace cell morphology from time to time by a quantitative increase in the concentration of different metal ions. Has her expertise in evaluation and passion for improving the health and wellbeing. Her open and contextual evaluation model based on responsive constructivists creates new pathways for improving healthcare. She has built this model after years of experience in research, evaluation, teaching, and administration both in hospital and education institutions. The foundation is based on the fourth-generation evaluation (Guba& Lincoln, 1989) which is a methodology that utilizes the previous generations of evaluation: measurement, description, and judgment. It allows for value-pluralism. This approach is responsive to all stakeholders and has a different way of focusing.

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