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TWO HIGHLY SENSITIVE AND SELECTIVE COLORIMETRIC "OFF–ON" RHODAMINE-BASED FLUORESCENT CHEMOSENSOR FOR DIVALENT MERCURIC ION DETECTION

Abstract

Purpose: The design of artificial chemosensors for selective and sensitive quantification of biologically and environmentally heavy- and transition-metal ions in solution has attracted wide-spread interests of chemists, biologists, clinical biochemists and environmentalists. The mercuric ion, Hg [II], combines with both inorganic and organic ligands, which can readily penetrate through biological membranes even at very low concentration, the US Environmental Protection Agency (EPA) standard for the maximum allowable level of inorganic Hg[II] in drinking water is 2 ppb. Recently, the design and development of fluorescent probes for Hg[II] has attracted a great deal of attention[1-2].

Methodology: On the basis of the well-known spirolactam (non-fluorescent) to ring-open amide (fluorescent) equilibrium, rhodamine frameworks have been considered an ideal mode for the construction of the off-on systems that have frequently been utilized to design fluorescence enhanced probes for metal ions[3]. In this paper, two rhodamine-based chemosensors were designed for reversible and highly selective Hg[II] determination with a light "off–on" switch. They were successfully characterized by HR-MS,1H NMR and 13C NMR.

Results and Conclusions: The two chemosensors were found to exhibit a reversible colorimetric response and exhibit high selectivity and sensitivity for Hg(II) ion over other commonly coexistent metal ions. Their selectivity is excellent, and the detection of Hg(II) at ppb level is still available. The colorimetric and fluorescent response to Hg(II) can be conveniently detected even by the naked eye, which provided a facile method for visual detection of Hg(II) in the preparation of space exploration endeavours to find existence of the Hg(II).

References

[1] G.W.Gokel, W.M. Leevy, M.E. Weber. Chem. Rev. 2004, 104, 2723–2750.
[2] X. Chen, T. Pradhan, F. Wang, J. Kim, J. Yoon, Chem. Rev. 2012, 112, 1910–1956.
[3] R. Han, X. Yang, D. Zhang, M. Fan, Y .Ye, Y. Zhao, New J. Chem., 2012, 36, 1961-1965.