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Enhanced fluorescence of terbium with thiabendazole and application in determining trace amounts of terbium and thiabendazole

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Abstract

In this paper, a simple, rapid and sensitive fluorescence method based on the formation of terbium (Tb^{3+}) complex has been developed for the rapid detection of Tb^{3+} in water. The fluorescence sensor has been studied by using terbium complexed with thiabendazole (TBZ) while acetonitrile (MeCN) as solvent. The complex was made up of TBZ as small-molecule ligand and Tb^{3+} as central ion. Fluorescence spectroscopy and UV spectroscopy together were used to study the behavior of the complexation of TBZ-Tb in this medium. Enhancement fluorescence was observed due to the efficient energy transfer process from TBZ to Tb^{3+}. And the affecting factors of the enhancement fluorescence were also studied in detail. Under optimal conditions, a linear relationship was obtained between the enhanced fluorescence