

Tetracycline as Chemosensor for Simultaneous Recognition of Al³⁺: Application to Bio-Imaging for Living Cells

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Abstract : Antibiotic tetracycline presents as a micro-contaminant in fresh water, wastewater and soils, causing environmental and health problems. In this work, tetracycline (TC) has been employed as chemo-sensor for the recognition of Al³⁺ without interfering other ions, and the results show that it enhances the fluorescence intensity for Al³⁺ and there is no interference from other coexisting cation ions (Cd²⁺, Ni²⁺, Co²⁺, Sr²⁺, Mg²⁺, Fe³⁺, K⁺, Sm³⁺, Ag⁺, Na⁺, Ba²⁺, Zn²⁺, and Mn²⁺). For the addition of Cu²⁺ to [TET-Al³⁺], it appears that the intensity of fluorescence has been quenched. Other combinations of metal ions in addition to TC do not change the fluorescence behavior. The stoichiometry determined by Job's plot for the interaction of TC with Al³⁺ was found to be 1:1. Importantly, the detection of Al³⁺ successfully employed in the real samples like living cells, and it was found that TC efficiently performs as a fluorescent probe for Al³⁺ ion in living systems, especially in *Saccharomyces cerevisiae*; this is confirmed by confocal laser scanning microscopy.

Keywords : chemo-sensor, recognition of Al³⁺ ion, *Saccharomyces cerevisiae*, tetracycline,

Conference Title : ICNSE 2018 : International Conference on Nanomaterials Science and Engineering

Conference Location : Venice, Italy

Conference Dates : November 14-15, 2018