

Visual detection of Al^{3+} ions using a non-cytotoxic azomethine linkage-based chemosensor

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ABSTRACT An azomethine linkage-based chemosensor, namely, 4-(furan-2-ylmethyleneamino)-2,3-dimethyl-1-phenyl-1,2-dihydropyrazol-5-one was synthesized the condensation of biologically relevant 4-aminoantipyrine and furfural. The synthesized chemosensor exhibited a remarkable color change from colorless to light yellow in the presence of Al^{3+} ions in pure acetonitrile. The study indicated the non-covalent interactions between compound **RM1** and Al^{3+} ions with a 2:1 binding stoichiometry and an association constant of $0.97 \times 10^4 M^{-1}$. The detection and quantification limit of the synthesized compound for the analysis of Al^{3+} ions have been determined as 101.54 μM and 338.50 μM , respectively. To determine the practical utility of the synthesized compound, strip test kits incorporated with **RM1** were prepared to provide on-site detection of aluminum ions, and a recovery percentage of 84–86% was observed. This compound was further evaluated for cytotoxicity against HeLa and Vero cell lines, where it emerged as a non-cytotoxic probe.

KEY WORDS Chemosensor, Azomethine, Aluminum, Furfural, 4-aminoantipyrine, Ultraviolet-visible spectroscopy

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INTRODUCTION