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## Electron-Deficient Tripodal Amide Based Receptor: An Exclusive Turn-On Fluorescent and Colorimetric Chemo Sensor for Cyanide Ion

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**KEYWORDS:** *Anion Recognition, Cyanide Sensors, Amide Receptors, and Anion- $\pi$  interaction*

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*Supporting Information Placeholder*

**ABSTRACT:** Here in, we have designed, synthesized and isolated sensor **L**, as an exclusive selective turn-on fluorescent chemo sensor for cyanide ion. The acetonitrile solution contains **L** with tetrabutyl ammonium cyanide, results sudden color change from colorless to yellowish-brown. Chemosensor **L** produced a strong fluorescence response with an enhancement of very high fluorescence intensity while addition of CN<sup>-</sup> ion and the strength of the chemosensor **L** towards cyanide binding is found to be  $3.9813 \times 10^4 \text{ M}^{-1}$ . In order to use this sensor in practical application, we also prepared a cassette which is fabricated with sensor **L** and we succeeded to sense cyanide ion.

### 1. Introduction

Designing a synthetic receptor is a challenging area of research, in the field of anion receptors chemistry.[1,2,3,4,5] In particular, selective sensing of environmentally relevant anions, are even more difficult task for scientific community since those (anions) have different shapes and dimensionality. Among anions family, cyanide is one of the most impended ion, for ecological system and presence of this anion in excess may leads to death.<sup>6,7,8,9</sup> Therefore, recently the researchers are focusing, by doing their research on designing of new chemo sensors for cyanide ion.

In literature, we are able to find only limited number of synthetic receptors which are able to sense the exclusively/selectively cyanide ion and the principle of sensing in those cases are, based on the interaction between binding units of sensor molecule and cyanide through hydrogen bonding, some cases it is also observed the change in absorption and emission properties of receptors upon anion binding. [10,11,12,13,14,15,16,17]

Tris (2-aminoethyl)amine (tren, **L**<sup>1</sup>) was widely used by researchers to construct the varieties of anion receptors, [18-28] in addition, it is also observed that functional groups which are attached into the tren (**L**<sup>1</sup>) unit, has altered the strength and selectivity of the corresponding anion receptors[27] At this juncture, since tris (3-aminopropyl)amine, (**L**<sup>2</sup>) [29-30] is still unexposed towards the construction of anion

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