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Extending photophysical behavior of Schiff base tripod for the speciation of iron and fabrication of INHIBIT type molecular logic gate for fluorogenic recognition of Zn(II) and Cd(II) ions

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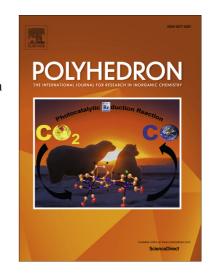
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## ACCEPTED MANUSCRIPT

1 2	Extending photophysical behavior of Schiff base tripod for the speciation of iron and fabrication of INHIBIT type molecular logic gate for fluorogenic recognition of Zn(II)
3	and Cd(II) ions
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7	
8	A tripodal Schiff base derived by the condensation of tris(2-aminoethyl)amine and 2-
9	hydroxynaphthalene-1-carboxaldehyde, and characterized by single crystal X-ray diffraction
10	has been explored herein as a chemosensor for metallic species. Although, its fluorogenic
11	response towards Zn <sup>2+</sup> (in 95:5 ethanol-water solvent) has been already reported, however, its
12	utilization for the naked eye speciation of iron and fluorogenic response towards Cd2+ ions
13	needs to be explored. It exhibits pronounced fluorescence signaling for $Zn^{2+}$ and $Cd^{2+}$ as well
14	as chromogenic response towards Fe3+, Fe2+, Zn2+ and Cd2+ ions. The addition of metallic
15	cations induces a remarkable colorimetric response from yellow to colorless (for Zn <sup>2+</sup> , Cd <sup>2+</sup> ),
16	purple (for Fe <sup>2+</sup> ) and light green (for Fe <sup>3+</sup> ) visible to naked eye. Interestingly, the sensor can
17	easily differentiate two states of iron (Fe <sup>3+</sup> from Fe <sup>2+</sup> ) by revealing distinctive colors and
18	different absorption maxima. The detection limit of the sensor towards $Zn^{2+}/Cd^{2+}$ is low
19	down to nanomolar concentration (86 nM and 50 nM, respectively). Moreover, the sensor can
20	be applied for the fabrication of fluorogenic molecular switch, which turns "ON" upon
21	selective binding with Zn <sup>2+</sup> /Cd <sup>2+</sup> ions and turns "OFF" in the simultaneous presence of
22	Zn <sup>2+</sup> /Cd <sup>2+</sup> and IO <sub>4</sub> ion. Thus, it is potentially significant sensor and should be explored
23	further for environmental applications.
24	Keywords
25	Tripodal ligand, Schiff Base, INHIBIT logic gate, Zn <sup>2+</sup> , Cd <sup>2+</sup> , Fe <sup>2+</sup> , Fe <sup>3+</sup> , colorimetric sensor,
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