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# Recognition of $\text{Al}^{3+}$ based on a naphthalene-based “Off-On” chemosensor in near 100% aqueous media

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**Abstract:** An efficient fluorescent  $\text{Al}^{3+}$  sensor, 2-hydroxy-1-naphthylaldehyde nicotinoyl hydrazone (HL) has been designed and synthesized. The receptor shows “off-on” fluorescent responses toward  $\text{Al}^{3+}$  in near 100% aqueous media. other relevant metal ions such as  $\text{Li}^+$ ,  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Ca}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Co}^{2+}$ ,  $\text{Mn}^{2+}$ ,  $\text{Ni}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Ba}^{2+}$ ,  $\text{Fe}^{2+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Hg}^{2+}$ ,  $\text{Pb}^{2+}$ ,  $\text{Sc}^{3+}$ ,  $\text{Fe}^{3+}$ ,  $\text{Cr}^{3+}$  caused almost no fluorescence increase. The reason for this phenomenon is that the addition of  $\text{Al}^{3+}$  to the solution of HL induce the formation of a 1:1 stoichiometry of the binding mode of L-Al(III) which inhibits the excited-state intramolecular proton transfer (ESIPT) and photoinduced electron transfer (PET). More importantly, the reversibility of the recognition process of HL was performed by adding a  $\text{Al}^{3+}$  bonding agent  $\text{Na}_2\text{EDTA}$ .

**.Keywords:** naphthalene; fluorescence sensor;  $\text{Al}^{3+}$ ; aqueous media; ESIPT/ PET

## 1. Introduction

The development of selective and sensitive fluorescent sensor for the detection of metal ions has received more and more attention due to fundamental roles in medicine,

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