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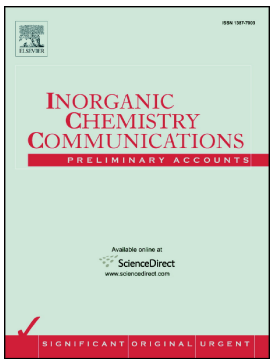

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A naphthol-based highly selective fluorescence turn-on and reversible sensor for Al(III) ion

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Abstract:

A naphthol derivative (*E*)-1-((2-(benzo[d]thiazol-2-yl)hydrazono)methyl)naphthalen-2-ol (NABT) exhibits an "off–on-type" fluorescent chemosensing for the detection of Al^{3+} ions, due to chelation-enhanced fluorescence (CHEF). The fluorescence intensity at 515 nm (excitation at 420 nm) of NABT increases about 42-fold upon addition of 20 equivalent Al^{3+}. Moreover, the binding details of NABT with Al^{3+} were determined by ^{1}H NMR and ESI-MS studies. The NABT interacts with Al^{3+} in a tridentate mode to form [Al(NABT)(DMSO)], [Al(NABT)Cl(DMSO)], [Al(NABT)$(DMSO)_2$] and [Al$(NABT)_2$] complexes. The addition of EDTA to NABT–Al^{3+} complex quenches the fluorescent intensity, indicating that NABT could serve as a reversible chemosensor.

Keywords: Turn-on; Fluorescent chemosensor; Aluminum ion; Selectivity; Reversibility