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A Chiral Polymer as Chromo-Fluorescence and CD Response  
Sensor for Specific Recognition of Fluoride

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**Abstract:**

A new kind of polymeric chemosensor containing chiral phenylglycine and 1-phenethylamine moieties in the side chain was synthesized by reversible addition-fragmentation chain transfer (RAFT) polymerization, which can guarantee controllable molecular weight, narrow molecular weight distribution, and precise polymer structure. As a chemosensor, the resulting polymers showed UV-vis and fluorescence spectra changed upon addition of F<sup>-</sup> relative to other anions including Cl<sup>-</sup>, Br<sup>-</sup>, HSO<sub>4</sub><sup>-</sup>, AcO<sup>-</sup>, NO<sub>3</sub><sup>-</sup>, H<sub>2</sub>PO<sub>4</sub><sup>-</sup>, and N<sub>3</sub><sup>-</sup>. When F<sup>-</sup> was added at high concentrations, the polymer gave detectable color change from colorless to yellow, which was attributed to the deprotonation process of the acylamino N-H group and the mechanism was supported by the <sup>1</sup>H NMR titration. Furthermore, the addition of F<sup>-</sup> also can lead to a most pronounced change of CD spectra of the chiral polymer, indicating this kind chiral sensor can also be used as a probe for selective recognition of F<sup>-</sup> based on CD spectra.

**Keywords:** chiral polymer; sensor; anion recognition; RAFT polymerization

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