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Highly selective and sensitive fluorescent probe for the detection of nitrite

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Abstract:

A simple and reliable fluorescent nitrite (NO_2^-) probe, 2-(1H-phenanthro[9,10-d] imidazol-2-yl)aniline (PA), was rationally developed based on a novel NO_2^--mediated diazozation and subsequent cyclization. The new sensing mechanism of the probe was confirmed by using NMR, IR spectra, control experiments and DFT calculations. The synthesized probe showed low pH dependence, fast and highly selective fluorescence response to NO_2^- over other species. Under the optimized conditions, the linear response of the probe toward NO_2^- was in the range of 0.1 to 10 μM with a low detection limit of 4.3×10^{-8} M. Moreover, PA was successfully applied for the determination of NO_2^- in environmental samples and food products.

Key words: Nitrite; Fluoresce Probe; Highly Selective Response

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