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New 8-Aminoquinoline Derivatives as “Turn-On” Fluorescent Sensor for Cd(II) ion Detection

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Two 8-aminoquinoline derivatives, **Q1** and **Q2**, containing one and two quinoline groups, respectively, are synthesized. In water, **Q1** and **Q2** showed strong electronic absorption peaks at 340 nm and 350 nm, with molar extinction coefficients of 3605 and 2475 M⁻¹cm⁻¹, respectively. The solutions are weakly fluorescent having quantum efficiency below 10%. In the presence of metal ions, the strong fluorescence signal at 480 nm is observed exclusively with Cd(II) ion. The fluorescence enhancement was probably the result of the restriction of photo-induced electron transfer (PET) process. In aqueous Tris solution pH 7.4, **Q2** shows significantly greater fluorescence enhancement ratio (I/I₀) of 30-fold comparing with 7-fold observed for **Q1**. The fluorescence detection of Cd(II) ion in water is possible in a wide pH range of 4 to 9 with the detection limit as low as 25 nM.

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