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Abstract

A newly designed fluorescence dye **L** based on di-2-picolyamine (DPA) moiety as a chelator was obtained under the protection of N_2 at 120^{o}C, and KI as catalyst with relatively better yield. More interestingly, **L** not only could selectively and sensitively detect Cu^{2+} ions in aqueous medium but also examine the Cu^{2+} ions of the actual water samples. Nevertheless, **L** could be visual in Hela cells with excellent cell permeability, *viz*, monitoring exogenous Cu^{2+} ions as well as realizing an "on–off–on" process.

Keywords: di-2-picolyamine, fluorescence, bio-imaging

1. Introduction

Pyridine derivatives, as nitrogen-bearing heterocyclic compounds, have attracted considerable attentions for strong coordination ability, unique biological activity and environmental compatibility, which has seen many applications in biological imaging and vivo detection, for example, measuring intracellular free zinc in living cortical neurons[1], and capturing Aβ deposition in a living AD model mouse, *et al*[2-7]. In particular, di-2-picolyamine (DPA) as recognition group of fluorescent molecular dye stands out from pyridine derivatives, providing three nitrogen atoms to coordinate with transition metal ions, especially Cu^{2+} ions. Copper, as the third most abundant transition metal, is the well-known trace element in various biological, which do duty as a cofactor for all kinds of enzymes, including cytochrome oxidase, superoxide