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Copper nanoclusters as probes for turn-on fluorescence sensing of L-lysine

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Abstract

Herein, a unique protocol based on copper nanoclusters (CuNCs) probe for turn-on fluorescence sensing of L-lysine was developed. The fluorescent CuNCs with ovalbumin as the stabilizer was prepared by a simple, one-step and green method. When 370 nm was used as the excitation wavelength, the resultant CuNCs exhibited a pale blue fluorescence with the maximum emission at 440 nm. Interestingly, existence of L-lysine evoked the obvious fluorescence intensity increase of CuNCs. The detection limit of the proposed method for L-lysine was 5.5 μM, with a good linear range from 10.0 μM to 1.0 mM (r^2 = 0.999). Moreover, the possible mechanism for enhanced fluorescence intensity of CuNCs by addition of L-lysine was explored and discussed briefly. Further, the as-prepared fluorescent CuNCs was successfully applied in detection of L-lysine in urine. Our results demonstrated that L-lysine could be monitored by the probe, providing new path for construction of CuNCs as fluorescent probes and showing great potential in quantification of L-lysine in real samples.

Keywords

copper nanoclusters, ovalbumin, turn-on fluorescence, L-lysine, urine

1. Introduction