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Fluorescence red-shift of gold-silver nanoclusters upon interaction with cysteine and its application

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Abstract

In this work, gold-silver alloy nanoclusters (AuAg NCs) were demonstrated as a novel probe for fluorescent detection of cysteine (Cys). The alloy nanoclusters were fabricated by bovine serum albumin as a template and $NaBH_4$ as a reducer. They showed a red emission at 650 nm. The interaction between AuAg NCs and Cys was investigated. The thiol group in Cys molecules has strong affinity on the surface of metals, which results in variation of fluorescence peak wavelength. It was further demonstrated that this red-shift of fluorescence had a good linear relationship with the concentration of Cys in the range of 2-100 μM. The method was successfully applied for human plasma analysis with satisfactory results. This novel strategy was expected to provide a potential opportunity for extending the application of novel metal nanoclusters in fluorescence.

Keywords: gold-silver nanoclusters; fluorescence peak wavelength shift; cysteine

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