

Optimization of synthesis conditions protein-modified luminescent gold nanoclusters.

Kseniya R. Kalishina, Yulia A. Podkolodnaya, Anna M. Vostrikova and Irina Y. Goryacheva

Saratov State University, 83 Astrakhanskaya Street, Saratov, 410012, Russia

Luminescent gold nanoclusters (GNCs) are structures consisting of approximately 25 gold atoms covered with a functional shell. They attract a lot of attention due to their bright luminescence, photostability, large Stokes shift and biocompatibility. GNCs are being developed for use in immunoassay, bioimaging, and theranostics.

Many researchers use the standard method for obtaining gold nanoclusters - synthesis at a temperature of 37⁰C. But the conditions for the synthesis of GNCs need to be optimized to obtain structures with the highest quantum yield of luminescence. In our study, we compare the hydrothermal method and temperature synthesis at atmospheric pressure of obtaining GNCs. To do this, an aqueous solution of chloroauric acid and bovine serum albumin was mixed, after which the solution was adjusted to pH ~ 11.5 by adding NaOH. The resulting solution was heated at a temperature of 60⁰C. The solution color during the synthesis changed from light yellow to brown. The obtained GNCs had an absorption peak in the region of 280 nm. The PL maximum was in the region of 650 nm. The sample obtained by heating at atmospheric pressure was characterized by the highest emission intensity. The resulting GNCs can be used to determine drugs in biological fluids.

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