

NANOPARTICLE-ANTIBODY CONJUGATES AS A POTENTIAL LABEL IN THE ELECTROCHEMICAL IMMUNOASSAY

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Modern medical diagnosis characterized by the use of a wide variety of viral agents detection methods. Identify the pathogen, especially in severe diseases, it is important for prediction of further disease progression, and to choose the right method of treatment. The rapid identification of the virus at the alleged contamination, allowing urgently undertake counter-measures, it is a particularly actual problem.

The present work is devoted to development approach to the determination of antigens of viruses, which consist in producing an electrochemical signal from the immunocomplex "target analyte (antigen) – conjugate antibodies and nanoparticles Fe_3O_4 », localized on the surface of the electrode. To implement the approach amino modified nanoparticles magnetite and their conjugates with measles virus antibodies were synthesized (Fig. 1, 2).

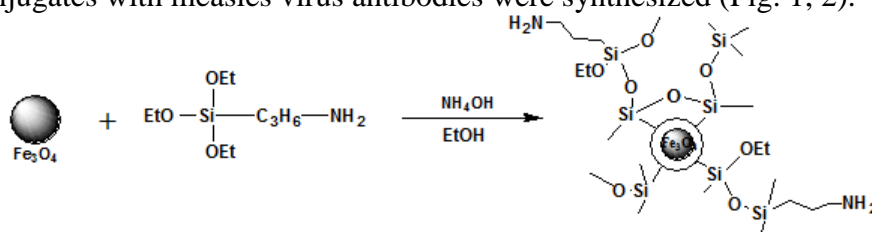


Fig. 1. Scheme of the synthesis of amino modified magnetite nanoparticles

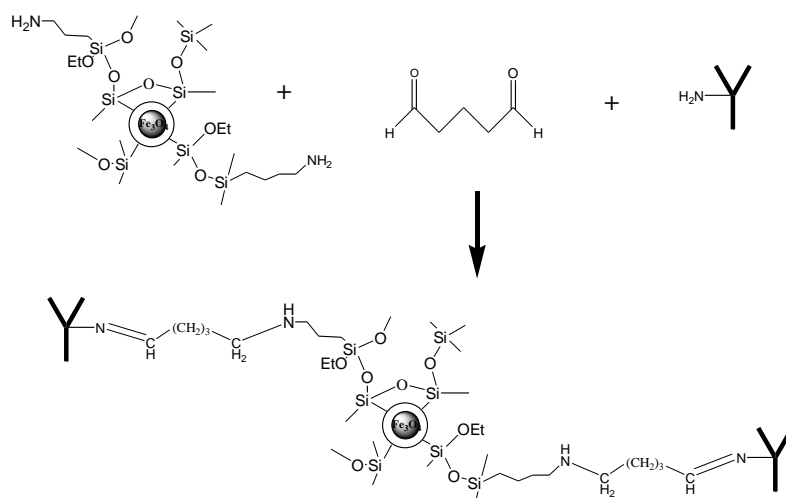


Fig. 2. Preparation of conjugates of antibodies with magnetite nanoparticles

The combination of magnetic properties Fe_3O_4 and specific characteristics of antibody in conjugate allow to use them as a direct label in an electrochemical immunoassay and develop a way to express the definition of virus / antigen, which has no analogues in medical practice.

For Fe_3O_4 -conjugates synthesized antibody in an aprotic organic medium (LiClO_4 solution in acetonitrile) was obtained a linear dependence of direct electrochemical analytical signal vs. conjugates content in the original suspension.

The regression equation: $I = 3.158 \pm 0.008 \times \log C_{\text{conjugates}} - 10.14 \pm 0.05$.

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