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Kinetics of adsorption of humic acid from aqueous solution onto PVDF nanofiber

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The main objective of this study is to investigate the kinetic sorption of humic acid (HA) from aqueous solution onto the polyvinyl di fluoride Nano fiber. Batch adsorption experiments were carried out using HA solution as an adsorbate under variety of concentration in the range of 20-100 mg/L. It was observed that the amount of humic acid adsorbed decrease with an increase in the HA concentrations. The kinetic experimental data proportionally correlated with the pseudo-second-order kinetic model with a rate constant in the range of 0.024-0.065 g mg-1 min-1.

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Solar energy use for syntheses of functional ceramics

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Barium titanate ($BaTiO_3$) is a promising material for the development and production of a new generation of small size multilayer capacitors and other thin-film varistor components of microwave technology. The prospect of improved device parameters using nanosized $BaTiO_3$ increases the purity requirements, defects and the amount of dielectric parameters of this material. The structure and properties of ferroelectric dielectric, including barium titanate, essentially depends on the particle size. It is known that methods of synthesis of these compounds do not allow received products that fully meet these requirements. Solid-phase synthesis due to the low degree of homogenization of the components and uncontrolled aggregation of the particles does not allow obtaining products of stoichiometric composition in the form of nanosized powders narrow granulometric classes. Using the method of self-propagating high-temperature synthesis reduces the time and energy costs, but does not resolve most of the problems of sintering method. Mechanochemical synthesis allows obtaining barium titanate nanoparticles with high reaction surface with less energy consumption, however, increases the degree of product contamination due to abrasion of the equipment used, and to complete the synthesis more high-temperature processing is needed. Our proposed method for the synthesis of barium titanate from its melt obtained in the solar furnace allows to obtaining a more fine (nanosize grain) powders and ceramics based on this material shows high values of the dielectric constant and low dielectric loss.

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Notes: