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Adsorption of Bovine Serum Albumine on CeO2

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Abstract : Preparation of nano-particles of cerium oxide and adsorption of bovine serum albumine on them were studied. Particle size distribution and influence of pH on zeta potential of prepared CeO2 were determined. Average size of prepared cerium oxide nano-particles was 9 nm. The simultaneous measurements of the bovine serum albumine adsorption and zeta potential determination of the (adsorption) suspensions were carried out. The adsorption isotherms were found to be of typical Langmuir type; values of the bovine serum albumin adsorption capacities were calculated. Increasing of pH led to decrease of zeta potential and decrease of adsorption capacity of cerium oxide nano-particles. The maximum adsorption capacity was found for strongly acid suspension (am=118 mg/g). The samples of nanoceria with positive zeta potential adsorbed more bovine serum albumine on the other hand, the samples with negative zeta potential showed little or no protein adsorption. Surface charge or better say zeta potential of CeO2 nano-particles plays the key role in adsorption of proteins on such type of materials.

Keywords : adsorption, BSA, cerium oxide nanoparticles, zeta potential, albumin
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