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Interaction Study on Bovine Serum Albumin Physically Binding to Silver Nanoparticles: Evolution from Discrete Conjugates to Protein Coronas

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Abstract: The nanostructures formed by inorganic nanoparticles together with organic molecules especially biomolecules have attracted increasing attention from both industries and researching fields due to their unique hybrid properties. In this paper, we systemically studied the interactions between amphiphilic polymer coated silver nanoparticles and bovine serum albumins by employing the fluorescence quenching approach in combination with the Stern-Volmer and Hill equations. The binding affinity was determined to $1.30 \times 10^7 \text{ M}^{-1}$ and the interaction was spontaneously driven by mainly the van der Waals force and hydrogen-bond mediated interactions, and negatively cooperative from the point of view of thermodynamics. With the non-uniform coating of amphiphilic polymer, the

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