STUDY OF NANOPARTICLE BINDING IN A FLUID SYSTEM BY SURFACE PLASMON MICROSCOPY

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Abstract

Growing interest to characterization of nanoparticles (NPs) requires the development of advanced measurement techniques. Surface plasmon microscopy appears as a perfect tool for concentration analysis and study of binding processes. The method is based on the phenomenon of the surface plasmon resonance in a thin gold layer being illuminated by a laser light. A gold coated prism builds a face of a flow cell. Under resonance conditions the sensor layer effectively absorbs the light energy and surface plasmons are excited. NPs bound to the sensor interact with surface plasmons. That leads to the light emission, which is detected by a CMOS camera. If the NPs are sticking to the sensor at the first contact, the concentration of NPs in suspensions can be derived from the binding rate using a theoretical mass transport model. Binding rate measurements allow extracting information about NP binding mechanisms on the base of extended models.

Keywords: Surface plasmon resonance, nanoparticle binding mechanisms

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