Surface plasmon resonance sensor for detecting of arsenic in aqueous solution using polypyrrole-chitosan-cobalt ferrite nanoparticles composite layer

ABSTRACT

The detection and measurement of low concentrations of arsenic (V) are the subjects of intense research interest in chemistry and environmental activity. In this research, a polypyrrole-chitosan/cobalt ferrite nanoparticles composite layer was prepared using an electrodeposition method on a gold-coated glass slide. The composite layer was characterized using field emission scanning electron microscopy, energy-dispersed spectroscopy, atomic force microscopy, and a high surface stylus profilometer. The composite layer was used to detect the arsenic in water, and the sensor limitation was about 0.001 ppm. The composite layer was tested using atomic-force microscopy before and after the detection of arsenic. As a result, the roughness was disoriented, as the arsenic was bound on the surface of the composite layer.

Keyword: Arsenic; Polypyrrole-chitosan; Cobalt ferrite nanoparticles; Surface plasmon resonance