Abstract

Modifications of gold electrode have been made by using polypyrrole and gold nanoparticles. The modified gold electrode was used for the determination of chromium ion in acetate buffer pH 5. Deposition of polypyrrole on gold surface was made by electropolymerization using cyclic voltammetry technique in KCl 0.1 M as supporting electrolyte. The modification of electrode was continued by addition of gold nanoparticles using Layer by Layer (LBL) deposition. Signals of gold electrode, polypyrrole modified gold electrode, and polypyrrole/gold nanoparticles modified gold electrode for determination of chromium ion were compared. The gold electrode showed no response to chromium ion. Responses of the polypyrrole modified gold electrode and the polypyrrole/gold nanoparticles modified gold electrode showed increased with the increasing of chromium ion concentration. The reduction potential of polypyrrole modified gold electrode was 0.464 V, the limit of detection and sensitivity of the electrode are 13.48 µM and 0.085 µA.µM⁻¹.mm⁻² respectively. The reduction potential of the polypyrrole/gold nanoparticles modified gold electrode was 0.604 V, the limit of detection and the sensitivity are 12.31 µM and 0.234 µA.µM⁻¹.mm⁻² respectively.

Kata kunci : gold nanoparticles, chromium, polypyrrol, cyclic voltammetry