**Tables Captions**

Table 1 The operating conditions optimized for Cr(VI) determination with DP-ASV using a Aufilm-GCE sensor

|  |  |
| --- | --- |
| Experimental conditions:(DP-ASV) | Optimized Value |
| Supporting electrolyte | HCl 0.1 M |
| pH | 1.0 |
| Deposition time | 120 s |
| Deposition potential | -0.2 V |
| Detection potentiala | +0.3 V |
| Scan rate | 100 mV/s |
| Potential scan | -0.2 to 0.8 V |
| Modulation amplitude | 20 mV |
| Modulation time | 5 ms |

Table 2 Analytical performance of different modified electrodes for Cr(VI) determination.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Modified electrode** |  | **Method** | **LOD (µg/L-1)** | **LDR (µg/L-1)** | **Reference** |
| Electrochemically activated GCE | DPV | 6.25 | 20.8–13000 | *Richtera et al 2016* |
| Gold screen printed macro electrode | LSV | 228 | 520-84240 | *Metters et al 2012* |
| AuNP-ITO electrode d |  | CV c | 104 | 260–5200 | *Tsai and Chen 2008* |
|  | Amperometry | 5.2 | 26–2600 |  |
|  |  |  |  | *Tsai and Chen 2008* |
| Ag NPs a - carbon SPE e |  | DPV | 44.2 | 26–1976 | *Domínguez-Renedo et al 2008* |
| Au NPs - carbon SPE |  | DPV | 20.8 | 20.8–1664 |  |
| Ag plated-GCE | DP-ASV | 5.2 | 18.2-2080 | *Stojanović et al 2018* |
| Graphite screen printed electrode | LSV | 18.7 | 99.8-998.4 | *Hallam et al 2010* |
| Au film-GCE |  |  | DP-ASV |  5.5 |  10–120  | ***This work*** |
| aNPs – nanoparticles, bLSV – Linear sweep voltammetry, cCV – Cyclic voltammetry, dAuNP-ITO electrode – Gold |
| nanoparticle- electrodeposited indium-tin oxide electrode, e SPE – screen printed electrode  |  |

Table. 3Recovery test with sewage water samples

|  |  |  |  |
| --- | --- | --- | --- |
| Sample(sewage water)(µgL-1) | **Cr(VI)** Added(µgL-1) | **Cr (VI)** Found(µgL-1) | Spike Recovery(%) |
| Chromium Concentration | 88 | 86.1± 0.8 | 97.8 |
| 150 ± 0.6 | 176 | 176.5 ±0.5 | 100.3 |

**Figure Captions**



**Fig. 1** Effect of the accumulation time (30s; 60s;120s; 180s) at Aufilm/GCE**,** in 0.1 M HCl for concentration 50 µg L-1 Cr(VI)



**Fig. 2 a)** Anodic stripping voltammograms of 50 µg L–1 Cr(VI) at various electrolyte. **b)** Effect of pH on the peak current for the determination of Cr(VI) on Aufilm-GCE



**Fig. 3 a)** DP-AS voltammograms registered with Aufilm/GCE electrode in HCl 0.1 M, tdep=120 s, poteciacial from -0.2 to 0.8 V in different concetration of Cr(VI) .**b)** Calibration curve of various Cr (VI) concentration



**Fig. 4** DP-AS Voltammograms for standard additions of Cr(VI) in a sewage water sample, (0) sample signal before spiking and in concentrations (1)30, (2) 60, (3) 88 µg/L-1 Cr(VI)