

Enhancement of the performance of c-SWCNT based covalently functionalized potentiometric aptasensors by electrophoresis technique

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Abstract: Here, we report electrophoresis technique to remove non-covalently linked aptamers from potentiometric apta sensors surface. These biosensors were produced by covalently immobilized aptamer (ssDNA) as recognition layer to carboxylated-SWCNT (cSWCNT) on glassy carbon (*gc*) electrode. The potentiometric and CV results illustrate that those non-specifically adsorbed aptamers are not participating in charge transfer processes but they are playing a significant function to enhance the signal intensity.

Nevertheless, after electrophoresis, the sensitivity decreased remarkably despite the improvement of limit of detection and reproducibility. If the covalently immobilized probe density is sufficient, these investigations will introduce a simple, accurate and precise removal of non-specifically assembled aptamers from electrode surfaces to develop reproducible, regenerable and highly sensitive electrochemical apta sensors maintaining the stability of the sensing elements of the electrode surfaces.