S Y Lai et al., J Anal Bioanal Tech 2014, 5:4
http://dx.doi.org/10.4172/2155-9872.S1.018

OMICS Group Conferences
Accelerating Scientific Discovery

5th International Conference and Exhibition on
Analytical & Bioanalytical Techniques
August 18-20, 2014 DoubleTree by Hilton Beijing, China

Cyclic voltammetry characteristics of the portable electrochemical system in comparison with IM6ex workstation

S Y Lai[1], **C J Chen**[2], **J T Liu**[2], **S Kalpana**[1] and **J Z Tsai**[1]
[1]National Central University, Taiwan
[2]University of Chinese Academy of Sciences, China

Electrochemical analysis is a powerful tool for analyzing interfacial reactions as well as composition of analytes. In this study, a low-cost, portable, and easy-to-use instrument consists of hardware and software for electrochemical analysis was made. The cost of design is 1/1000 fold to compare with commercial systems, and the weight of this device is light for 120 grams. It includes cyclic voltammetry (CV), square wave voltammetry (SWV), alternating current voltammetry (ACV), linear sweep voltammetry (LSV) and constant voltage mode. Finally, this study used both portable device and commercial electrochemical workstation IM6ex to detect human serum albumin (HSA) by CV analysis employing screen-printed carbon electrode. From the results, decrease in peak current and increase in separation of peak potential were observed in the portable instrument (0.286 μA, 0.13 V) and commercial electrochemical workstation (0.294 μA, 0.15 V). It indicates that the resistant capability of ion transfer at the carbon electrode interface, causing the redox reaction current to decrease, and resulting in higher potential to urge the redox reaction. The portable device could observe the adsorption of HSA on electrode surface successfully, and all detection result was very close to the commercial electrochemical workstation. Besides, the device detects HSA more rapidly (~1min) than electrochemical workstation does. Therefore, this study shows that the new device offers fast detection of the proteins and opens interesting possibilities for the future development of light-weight, low-cost, portable electrochemical devices for the detection of different biomolecules in clinical diagnostics.

Biography

S Y Lai is a MS student of Electrical Engineering in National Central University, Jung-Li City, Taiwan. He received the BS degree in mechatronics engineering from National Changhua University of Education, Changhua City, Taiwan. His current research interests include biomedical signal processing, biosensor, micro-processor and C programing.

abc_sam_321@hotmail.com