Supplementary materials

Photoelectrochemical aptasensor for aflatoxin B1 detection based on an energy transfer strategy between Ce-TiO_2@$MoSe_2$ and Au nanoparticles

Yunfei Tang,[1] Xiaoqiang Liu,[*,1] Hejie Zheng,[1] Liwei Yang,[1] Lele Li,[1] Si Zhang,[1]

Yanmei Zhou[1] and Subbiah Alwarappan[2]

[1]Henan Joint International Research Laboratory of environmental pollution control materials, College of Chemistry and Chemical Engineering, Henan University, Kaifeng, Henan Province, 475004, P.R. China

[2]CSIR-Central Electrochemical Research Institute, Karaikudi 630003, Tamilnadu, India

[*]Correspondence to: xq_liu1975@yahoo.com; liuxq@henu.edu.cn

S1. The assembly process of PEC aptasensor was characterized by EIS technology.

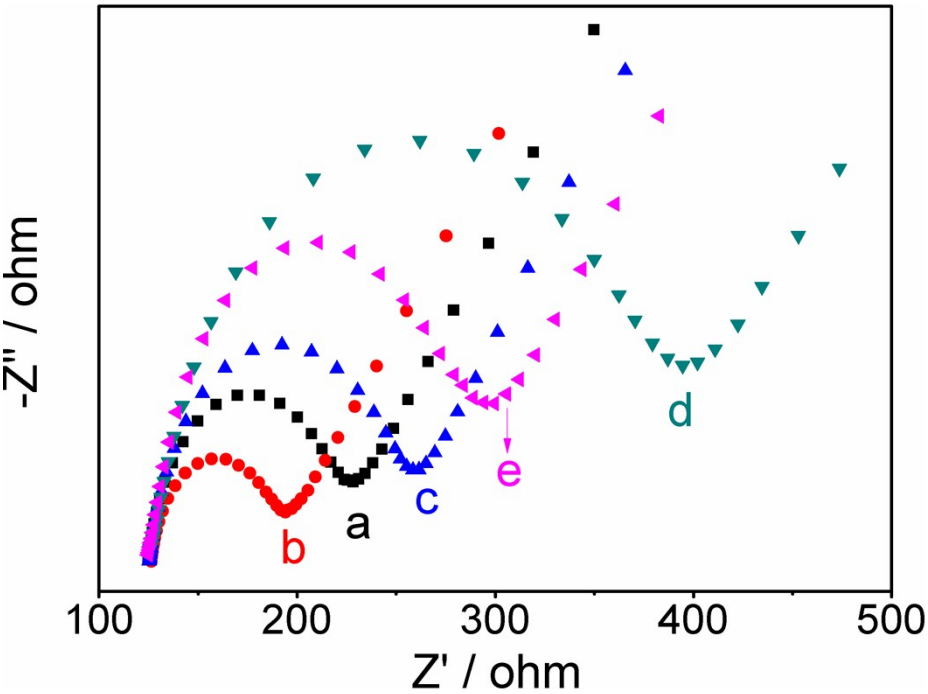

Fig.S1. EIS spectra of (a) Ce-TiO_2|ITO, (b) Ce-TiO_2@$MoSe_2$|ITO, (c) aptamer| Ce-TiO_2@$MoSe_2$|ITO, (d) AuNPs-labeled DNA|aptamer|Ce-TiO_2@$MoSe_2$|ITO and (e) AFB1|AuNPs-labeled DNA|aptamer|Ce-TiO_2@$MoSe_2$|ITO in 0.1M KCl containing 5mM $[Fe(CN)_6]^{3-/4-}$.

The assembly process of PEC aptasensor was also demonstrated by EIS spectra (Fig.S1) in the supplementary materials. As shown in Fig.S1, the arch portion in high frequency section represented the electron-transfer resistance (R_{et}) and the linear portion in low frequency section signified the diffusion process. Ce-TiO_2@$MoSe_2$|ITO (curve b) showed a smaller R_{et} than Ce-TiO_2|ITO (curve a) because Ce-TiO_2@$MoSe_2$ promoted the electron transfer of the probe on the modified electrode surface. After AFB1 aptamer was modified on Ce-TiO_2@$MoSe_2$|ITO (curve c), the R_{et} was increased due to the steric hindrance of DNA. The AuNPs-labeled

DNA|aptamer|Ce-TiO_2@$MoSe_2$|ITO electrode possessed a large half-circle diameter (curve d), indicating that AuNPs-labeled DNA was well hybridized with the aptamer. The sandwich structure was destroyed after AFB1 (10 ng mL^{-1}) was introduced into this system, leading to the decrease of R_{et} (curve e).