Evaluation of Zinc Oxide Tetrapods in Biosensing

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Zinc oxide (ZnO) is a well-known II-VI semiconductor material that has gained increased interest in past decades due to a wide direct band gap (3.4 eV), large exciton binding energy (60 meV) and high electron mobility (200 cm^2 V^{-1} s^{-1}) [1]. Owning to these unique properties, ZnO have been used for various applications such as biosensor and optoelectronic devices. With controllable techniques, ZnO can be synthesized with different morphologies such as nanowires, nanotubes and nanospheres. Recently ZnO tetrapods (ZnO-TPs) have attracted significant attention due to their unique morphology consisting of four branches joined together. The advantages of multiple electron transfer paths, high chemical stability and biocompatibility make ZnO-TPs a promising candidate in various novel biosensors [2].

In this work we report a systematical study on structural, electrical and optical properties of ZnO-TPs obtained from three different synthesis processes. The morphology of ZnO-TPs was confirmed as having four legs with micrometer size. In particular, the sensing properties of ZnO-TPs were investigated for targeted biosensing application.

References

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