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Towards high-volume, low-cost production of ZnO nanowires devices

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One-dimensional Zinc Oxide (ZnO) nanostructures have been studied extensively in recent years due to its unique chemical, electrical, optical and piezoelectric properties. They are excellent functional materials that have found many technological applications, ranging from sensors to solar cells. However, volume production of these devices at low cost still remains a technological challenge, hence impeding the commercialization of these devices. Here we discuss the selective patterning of ZnO nanowires through the use of flexographic printing of seed layers onto a silicon substrate. This high speed roll-to-roll printing technique lends itself to high volume, low cost production. Moreover, it can be applied on other substrates such as polymer substrates. ZnO nanowires array are grown on the printed seed layer through the use of either hydrothermal or electrochemical methods. Glucose biosensor based on ZnO nanowires fabricated using this printing technique has been demonstrated.

Biography

Kar Seng (Vincent) Teng is a lecturer at Swansea University and leads the Nanoelectronics Research Group within the Multidisciplinary Nanotechnology Centre in the College of Engineering. His research interest is in the application of nanotechnology in electronic materials and devices, which have major impacts in healthcare, energy and information technologies. His current research projects include nanobiosensors for continuous monitoring of chronic diseases, nanoplasmonics for photovoltaic and fabrication of nanowires devices using printing technology.

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