Development of Nanowires-based Electronic Device using LASER Ablation for Flexible/Wearable Application

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One-dimensional (1-D) metal oxide nanowires (NWs) are widely used for electronic devices due to their excellent properties such as a high sensitivity and a high scalability which originated in a high surface area to volume ratio of 1-D nanostructures. However, there are still lots of technical limitations, including controlling methods of transfer, alignment and density of NWs, to secure the uniform performance of nanomaterials-based devices. Here, we successfully patterned the Au or Al electrodes on flexible substrates through the LASER ablation technique, followed by sliding transfer of SnO_2 NWs which were grown by thermal chemical vapor deposition (CVD). The channel length between the electrodes was controllable with an additional mask during LASER ablation process. The transferred NWs were placed on the pre-patterned electrode with high alignment and showed electrical properties. Developed techniques, used in here, which can fabricate NW devices with LASER ablation is competitive not only in the simplification of the process but in the cost aspect, and it is expected to be widely used in areas requiring flexibility, such as wearable application.