

Flexible Electronics with Graphene: From Devices Towards System

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Abstract

Graphene is a material, which is very suitable for flexible electronics due to its excellent mechanical strength, high flexibility, as well as high mobility. In order to realize a wearable system based on graphene flexible devices, there are some requirements which need to be met. Besides the flexibility, scalability, as well as the required sensing functionality, the system should be ideally self-powering, and it should be able to realize wireless data communication with external transceiver. In this talk, we will present how metal-insulator-graphene (MIG) diodes [1,2] could address all the requirements, and therefore provide a new aspect for graphene based flexible electronics. The structure of such diodes are shown in Figure 1. Especially, such MIG diodes can be used for energy harvesting up to THz range in theory, that has already been demonstrated up to 170 GHz experimentally [4]. Moreover, monolithic microwave integrated circuits technology has been developed to realize different circuits, based on MIG diodes [4], which enables the wireless communications between the wearable system and external devices. To conclude, a wearable system could be built from technology based on MIG diodes, which represent high flexibility, high performance and high monolithically degree.

References

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Figures

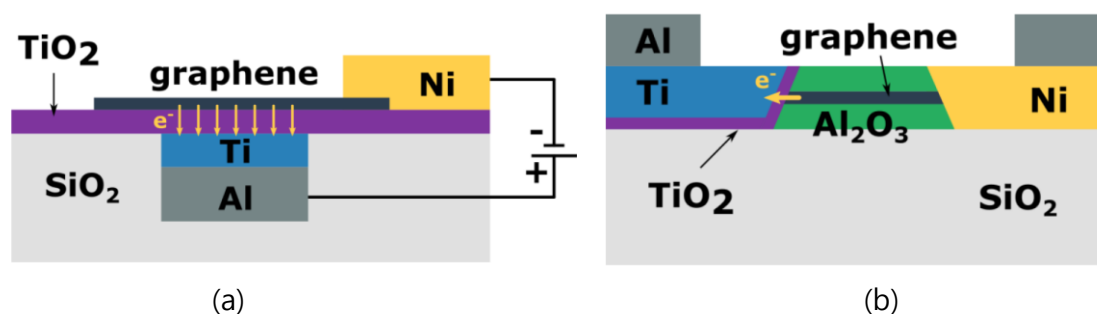


Figure 1: Structure of MIG diodes. (a) 2-dimensional MIG diode, (b) 1-dimensional MIG diode. [4]