Study of the optoelectronic properties of hybrid heterojunction

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Unique properties of ZnO and the ease of the growth of its nanostructures make this material extremely attractive for a variety of optoelectronic applications. To fully exploit the potential of ZnO, there is one essential problem, which must be solved: the preparation of a high-quality rectifying junction. The lack of p-type electrical conductivity in ZnO emphasizes the importance of the study of hybrid heterojunctions. One of the key issues in these heterojunctions is to understand the charge transport mechanism.
In this work, we focus on a systematic analysis of charge transport mechanisms in the hybrid heterojunctions formed between single or arrays of ZnO nanorods with other p-type materials (CuO; GaN; PEDOT:PSS) [1-4] or 2D graphene [5]. These nanostructured heterojunctions showed potential in different applications, such as highly sensitive UV photodetectors, or hydrogen sensors operated at room temperature.

References

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Figures

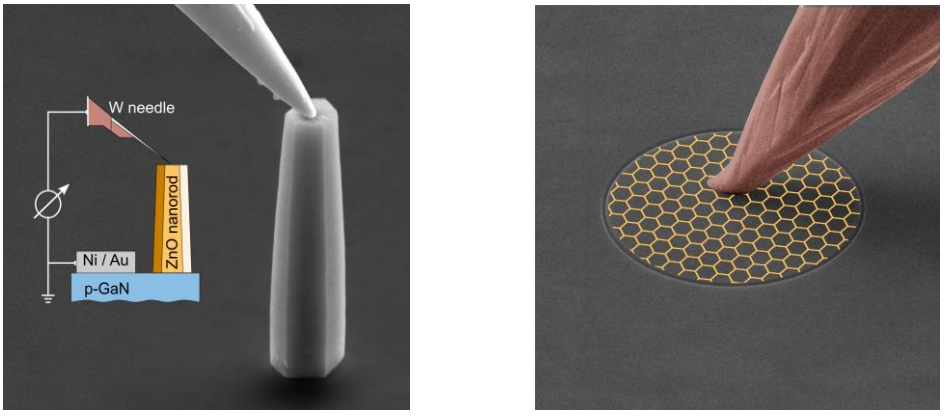

Figure 1: SEM image of the ZnO nanorod/GaN heterojunctions (left) and FIB-patterned graphene/ZnO structure (right) contacted by the tungsten nanoprobe for the SEM in-situ electrical measurements.