Oxidation and structure scheme studies for sensitivity improvement of Si1xGex nanowire biosensor

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Abstract

Because of the large surface-to-volume ratio of nano-structure, the silicon nanowires (SiNWs) provide a high sensitivity for highly sensitive detection of biological and chemical species. Moreover, the SiGe-on-Insulator (SGOI) by Ge-condensation process can enhance the mobility of hole carrier and then improve the nanowires' s conductance. In this study, we discuss SiGe nanowire structural effect by changing Si/SiGe stacked ratio and oxidation effect in different annealing ambient. The optimized Si/SiGe stacked structure with suitable oxidation process has more twice enhancement of sensitivity compared to conventional SiNWs biosensor.

Keyword：SiGe, Ge-condendation, Nanowire, Bisosensor