

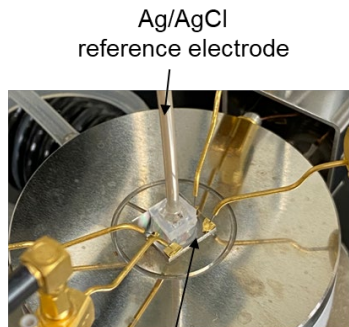
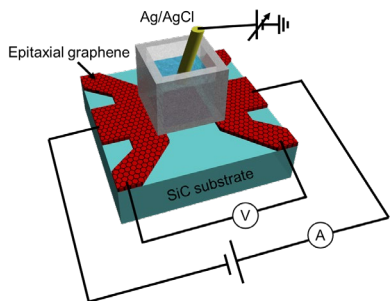


Faculty of
Science and
Technology
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Biosensors based on nano-carbon devices

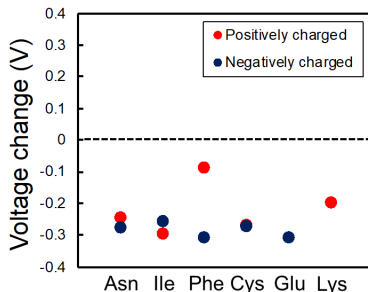
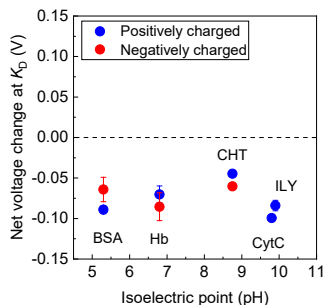
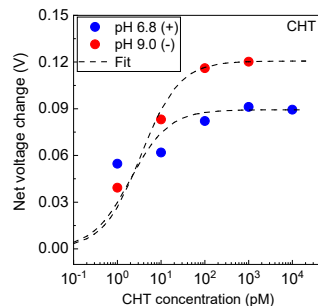
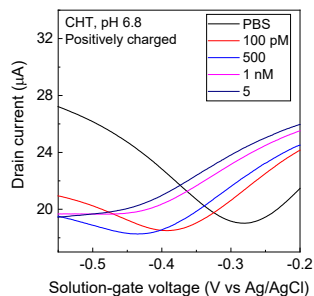
Associate Professor Yasuhide Ohno

Epitaxial graphene devices



Epitaxial graphene FET 10 mm

Protein & amino acid adsorption



Since the electrical characteristics of graphene field-effect transistors (FETs) are very sensitive for their environmental condition, the graphene FETs have high potential for chemical and biological sensors. In our laboratory, various sensors based on graphene FETs are investigated. The graphene FETs can be operated in the buffer solution by top-gated operation from a reference electrode without any passivation film owing to their large potential window.

The most original point of our work is to use the epitaxial graphene film on a SiC substrate, which has single crystal with large area. The epitaxial graphene FET is expected to obtain the inherent characteristics of graphene owing to the free of defects and dislocation. Now we have investigated protein and amino acid adsorption characteristics. They showed always electron doping to graphene, indicating the cleanness surface of the epitaxial graphene film. We now try to realize the specific target detection beyond the Debye screening length owing to the small quantum capacitance.

Keywords : graphene, device, biosensor

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