

## Substrate-Dependence of Graphene Memory Fabricated by Transfer Process

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A nonvolatile graphene memory device was fabricated using the transfer process. When transferring graphene to a substrate, a ferroelectric polymer film was used as the supporting film. After the transfer process, the ferroelectric polymer film was used without being removed. This is because the ferroelectric polymer itself has a memory function. When a unit block of ferroelectric-graphene film is stacked twice, two layers of graphene are used. One graphene is used as a gate electrode, and another graphene is used as a channel of a transistor. As voltage is applied to the gate graphene, it is possible to distinguish the recorded data by the resistance difference of the channel graphene.

However, we observed that memory characteristics depends on the substrate to be fabricated. The graphene memory fabricated on the silicon oxide did not show much difference between ON state and OFF state. On the other hand, the ON state and the OFF state of the memory made on the polyimide substrate were greatly different. In this paper, we explain the difference of two memory characteristics by the initial concentration difference of graphene by the substrate. If the initial concentration of graphene is high, the difference in concentration due to the external electric field is small. Therefore, it was confirmed that selection of the substrate in the graphene device fabrication is an important factor determining the device characteristics.

### Biography:

Mr. G. H. Lee is an undergraduate student at Jeju National University in Korea, and her research interests are semiconductor memory devices. Mr. S. A. Khan and Mr. S. A. Rahman are graduate students in master course. Prof. Dr. W. Y. Kim is an assistant professor at Jeju National University in Korea since 2017. His research fields include applications of ferroelectric polymer and graphene process.