전자 및 에너지 소자 응용에 필요한 그래핀 나노패턴 형성(Graphene nanopatterns for electronic and energy devices)

손정곤*
한국과학기술연구원 광전하이브리드 연구센터
(jgson@kist.re.kr*)

Graphene has great interests because of its incredible electronic and thermal properties for the potential future electronic devices and energy application. However, their intrinsic zero bandgap property and high thermal conductivity are fairly hard to perform the high on-off current ratio of field effect transistor and application to thermoelectric devices. For the overcoming this huddle, graphene nano-structures with sub-10 nm scales for the quantum confinement was suggested and showed opening bandgap and high on-off ratio experimentally. And also, thermoelectric property and thermal conductivity of nanoscale graphene structures can be significantly changed because of periodic phonon scattering and bandgap opening from confinement geometry, but it is fairly difficult to prove experimentally. In this presentation, we mainly show sub-10-nm graphene nano-ribbon array field effect transistors and monolayer graphene nanomesh for increasing thermoelectric properties which fabricated by block copolymers as a lithographical template on graphene monolayer sheets.