

Mesoepitaxy of graphene: continuous film formation

Seong-Yong Cho, Min-Sik Kim, Hyun-Mi Kim, Min-Su Kim, Ki-Ju Kim, Sang-Hoon Lee, and
Ki-Bum Kim*

Department of Materials Science and Engineering, Seoul National University, Korea

Polycrystalline nature of graphene is a major issue to be overcome in real application of CVD graphene. Recently, liquid Cu was used as catalytic substrate for graphene growth, and due to liquid surface nature, self-assembly of graphene islands was observed. However, stitching of each graphene islands still need to be investigated since thermal stress may result cracks. We verified that typical growth conditions for self-assembly of graphene on liquid Cu are not adequate for obtaining continuous graphene film, due to low supersaturation ratio. Two-step growth method was suggested in order to reduce thermal induced cracks, and fill the narrow gaps between graphene islands. Also, the transport behavior was studied via Van der Pauw measurement of the graphene film, and TLM patterning of two adjacent graphene islands. Self-assembled graphene shows lower resistance compared to randomly grown graphene islands which are typically observed on solid Cu.