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Proving grain boundaries and transport study of graphene grown on liquid Cu SEONG-YONG CHO, MIN-SIK KIM, KI-JU KIM, MIN-SU KIM, HYUN-MI KIM, SANG-HOON LEE, KI-BUM KIM, Seoul Natl Univ, DEPARTMENT OF MATERIALS SCIENCE AND ENIGNEEIRNG TEAM — We revealed grain boundaries of graphene grown on liquid Cu via hydrogen etching and Cu oxidation, and found out that small gap and voids exist between graphene islands on liquid Cu due to small supersaturation ratio which was required for self-assembly to occur. Modified two-step growth was applied in order to fill the gap between graphene islands and continuous graphene was synthesized on liquid Cu. The continuity of the film was verified through hydrogen etching and NaCl assisted oxidation. Electrical resistance of graphene grown on liquid Cu was lower than graphene grown on solid Cu if there is no crack damage which might be resulted from thermal stress related solidification of Cu and wet-transfer. Also, Hall mobility of graphene grown on liquid Cu shows two times higher value compared to that of graphene grown on solid Cu. In order to verify the aligned grain boundary of graphene on liquid Cu, direct patterning enabled electrode deposition on two neighboring graphene single crystal which aligns in the same orientation. Gran boundary resistance was negligible based on our electrical measurement results which has a great potential impact on graphene growth on liquid Cu.

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