

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Rapid Synthesis of Few Layer Graphene Films and Their Electrochemical Behavior as Li-ion Battery Anode LAMUEL DAVID, GURPREET SINGH, Kansas State University — We study the process of graphene growth on Cu and Ni substrates subjected to rapid heating (approx. 8 °C/sec) and cooling cycles (approx. 10 °C/sec) in a modified atmospheric pressure chemical vapor deposition furnace. Electron microscopy followed by Raman spectroscopy demonstrated successful synthesis of large area few-layer graphene (FLG) films on both Cu and Ni substrates. The overall synthesis time was less than one hour. Further, the as-synthesized films were utilized as anode material and their electrochemical behavior was studied in a lithium half-cell configuration. FLG on Cu (Cu-G) showed reduced lithium-alloying capacity when compared with SLG, BLG and Bare-Cu suggesting its substrate protective nature (barrier to Li-ions). While FLG on Ni (Ni-G) showed better Li-cycling ability similar to that of other carbons suggesting that the presence of graphene edge planes (typical of Ni-G) is important in effective uptake and release of Li-ions in these materials.

Lamuel David
Kansas State University

Date submitted: 19 Nov 2012

Electronic form version 1.4