

Abstract Submitted  
for the SHOCK19 Meeting of  
The American Physical Society

**Preparation of Graphene Materials through Pulsed Wire Discharge**<sup>1</sup> XIN GAO, kumamoto university, HAO YIN, China Academy of Engineering Physics, CHUNXIAO XU, Beijing Institute of Technology, SHIGERU TANAKA, KAZUYUKI HOKAMOTO, kumamoto university, PENGWAN CHEN, Beijing Institute of Technology — Graphene is a two-dimensional structure of carbon atoms packed into a honeycomb lattice, which is known as the thinnest material thus far. The graphene materials feature multiple properties and have been used in various applications. Pulsed wire discharge refers to a series phenomena induced by a huge energy input in a conductive wire using pulsed discharge. Once the current passes through the wire, it melts and vaporizes in microseconds to produce a mixture of droplets and vapors at high temperature and pressure. The products scatter out with a shockwave in medium and cools down to form nanoparticles subsequently. In this study, graphene materials were produced using graphite stick and graphite wire via pulsed wire discharge in distilled water. The as-prepared samples were characterized by various techniques to confirm the formation of graphene materials. In this method, delicate control of energy input is critical for graphene formation. The graphitic layers were exfoliated from graphite materials by thermal expansion effect. On the basis of pulsed wire discharge, the corresponding mechanisms that governs the graphene generation were carefully illustrated.

<sup>1</sup>This work is supported by the National Natural Science Foundation of China under grant nos. 11521062 and 11172043.

Xin Gao  
kumamoto university

Date submitted: 01 Apr 2019

Electronic form version 1.4