Chemical Vapor Deposition Synthesis of Graphene from Alcohol

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Introduction

- Graphene is a 2D sheet of sp\(^2\)-hybridized carbon.
- Right Graphene molecule structure.
- Graphene synthesis methods: Mechanical exfoliation, oxidation of graphite, liquid-phase exfoliation and epitaxial growth such as chemical vapor deposition (CVD).

Experimental

- CVD
  - EtOH (CH\(_2\)OH)
  - Temperature: 900°C
  - Pressure: 300 Pa
  - CVD Time: 5 Min

Results Cont’d

- CVD synthesis of graphene from Dimethyl Ether (DME) on Ni foil
  - Purpose: To see whether DME can also synthesize graphene.

Discussion

- We are capable of reproducing results of CVD synthesis of graphene on Nickel substrates with both ethanol and dimethyl ether as well as Copper substrates with ethanol.
- When using Nickel foil, high quality graphene can be obtained with 875°C and 900°C. When using Nickel foil, surface homogeneity is better achieved at 850°C and 950°C.
- Copper substrates can be used for graphene synthesis; however, surface homogeneity is difficult to achieve.
- Graphene can be synthesized from DME at lower temperatures than ethanol (750°C-850°C).

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