

## 第2回 ナノマテリアルセミナー

### 白いグラフェン～六方晶窒化ホウ素の結晶成長の世界 Chemical vapor deposition of hexagonal BN on Cu by using ammonia borane precursor

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日時: 5月10日(木) 11:00~12:00

場所: 研究実験棟Ⅱ 多目的室(K261)

Hexagonal Boron Nitride (h-BN) is a wide band gap (~6 eV) two-dimensional (2D) semiconductor consisting of  $sp^2$ -bonded alternating boron and nitrogen atoms in a honeycomb arrangement.<sup>1-3</sup> h-BN is researched to be a promising substrate for graphene-based electronics to achieve ideal carrier mobility, due to its atomic scale smoothness, free dangling bonds and charge traps with least lattice mismatch (1.7%).<sup>2-4</sup> h-BN has also attracted significant attention due to its thermal stability up to 800 °C in air, chemical inertness, deep ultraviolet (UV) luminance, stable thermal conductivity and superior elastic modulus, thus presenting wide applicability in the fields of frontier electric devices, protective coating materials, UV-light emitters, composites, and 2D hetero-structures<sup>2-5</sup>. For all the aforementioned application, large-scale production of high quality h-BN is highly desirable and chemical vapor deposition (CVD) technique is established as a promising route. However, so synthesized h-BN consisted of number of grain boundaries with few microns grain size<sup>6</sup>. We tackled here the controllable CVD synthesis of h-BN crystals larger than 25  $\mu\text{m}$ . As synthesized h-BN crystals by CVD were analyzed by optical microscopy (OM), SEM, XPS, Raman, AFM, and TEM. **Fig. 1 (a-c)** and **2 (a-d)** show the OM and AFM images of synthesized h-BN crystals. The details of h-BN growth and an effective approach of single batch CVD synthesis of graphene on h-BN will be discussed.

#### References:

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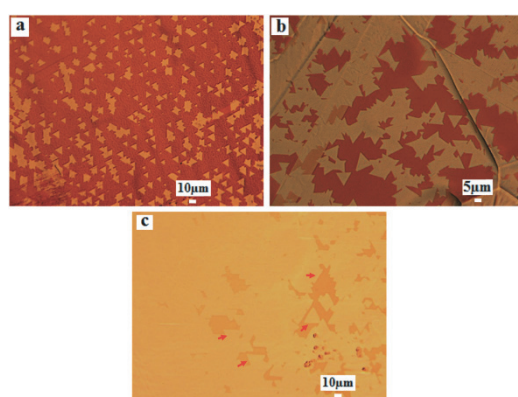


Fig.1

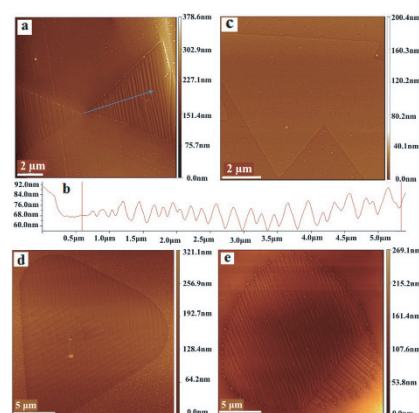


Fig.2



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主催: 名城大学ナノマテリアル研究センター