

課題番号 : F-16-KT-0056  
利用形態 : 機器利用  
利用課題名(日本語) :  
Program Title(English) : Preparation of porous graphene-based composites  
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## 1. 概要(Summary)

Graphene has been actively investigated for a wide range of applications, including energy storage, catalysis, and sensors. We have recently developed a method to construct graphene oxide nanosheets into porous scaffolds. In this project, we use the scaffolds as a starting material to prepare various graphene-based composites.

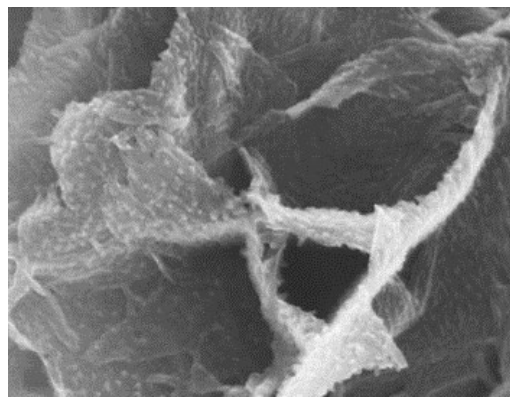


Fig. 1 SEM image of porous polyaniline (PANI)/graphene composite

## 2. 実験(Experimental)

### 【利用した主な装置】

超高分解能電界放出形走査電子顕微鏡 (C1)  
分析走査電子顕微鏡(C2)  
X線回折装置 (C3)

### 【実験方法】

#### Sample preparation (at iCeMS)

Porous graphene oxide scaffolds were prepared by using a diffusion-driven layer-by-layer (dd-LbL) assembly method [1]. Various precursors were reacted with the scaffold to form graphene composites.

#### Sample characterization (at Nanohub)

The structure of the graphene samples were examined under SEM of Nanohub. We have also used XRD to determine the material composition.

## 3. 結果と考察(Results and Discussion)

Through SEM imaging, we have been able to clearly determine the structure of the graphene composites produced at iCeMS. This information has been used to explain the material properties of the composites.

## 4. その他・特記事項(Others)

[1] J. Zou and F. Kim, Nat. Commun. (2014) DOI: 10.1038/ncomms6254.

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## 5. 論文・学会発表(Publication/Presentation)

- (1) X. Hong, B. Zhang, E. Murphy, J. Zou, and F. Kim, J. Power Sources **343** (2017) 60.
- (2) J. Zou, B. Zhang, E. Murphy, and F. Kim, Adv. Mater. Interfaces **2** (2016) 1600260.

## 6. 関連特許(Patent)

N/A.