Okayama University promotes research and development to contribute the creation of the sustainable society through problem solving with new ideas. In this exhibition & conference, we will present advanced nanotechnology developed by Okayama University at our booth (ST-10), and also make a presentation in detail at the A hall "Seeds and Needs Seminar 2013" from 14:00 o’clock on Wednesday 30th of January. We are looking forward seeing you.

1. **Recyclable Metal (Atom or Clusters) Catalysts Supported by Carbon Nanosheets**
   
   **1/30 (Wed.) (14:05 ~ 14:30)**
   
   **Division / Position**: Earth Life, and Molecular Sciences, Graduate School of Natural Science and Technology / Assistant Professor
   
   **Lecture Abstract**: Carbon materials consisting of few layer graphene sheets, which includes several metals (Pt, Pd, Ru, Rh, Au, Ag, Co, etc.), will be presented. The size of metal particles in our material can be much smaller than the metal nanoparticles supported on graphene sheets produced using general impregnation method. Clusters having diameter of sub-nanometer size and/or isolated atoms can be anchored on graphene sheets. Because not only metal (valence: 0) particles but also isolated metal atoms (valence: 1~) are supported on the material, it can be used for catalysts as an tractable alternative to several general metal-complex catalysts. Examples of the applications to some electrochemical or organic reaction using our material will be also presented.

2. **Applications of carbon nanotube films to frictional materials and micro channel**
   
   **1/30 (Wed.) (14:30 ~ 14:55)**
   
   **Division / Position**: Mechanical and Systems Engineering, Graduate School of Natural Science and Technology / Associate Professor
   
   **Lecture Abstract**: We have studied to apply carbon nanotubes to high and low friction materials under micro-milli Newton loads for MEMS devices. Carbon nanotube films have high frictional properties under micro-milli Newton loads; however their adhesion force are almost zero even high relative humidity. This is good for high frictional materials in MEMS grips and breaks. The high friction of carbon nanotube films are reduced by applying modulation. Moreover we found that frictions between carbon nanotube films and water droplets are very low. These low frictional phenomena can be applied to low frictional materials for MEMS. Moreover, we developed the method of making carbon nano materials high concentration in electroless nickel plating, and have applied it to the low friction. Furthermore, carbon nano materials are distributed in water and we have applied them to water lubrication. In addition, we have studied to form micro channels used the carbon nanotube film, and have applied it to the low friction. Furthermore, carbon nano materials using hyperthermal atom beams. carbon nano materials distributed in water for water lubrication, micro channels used carbon nanotube film.

3. **Nanofiber production by microchannel wet spinning**
   
   **1/30 (Wed.) (14:55 ~ 15:20)**
   
   **Division / Position**: Chemistry and Biotechnology, Graduate School of Natural Science and Technology / Professor
   
   **Lecture Abstract**: We have developed the wet-spinning of nanofibers using a microfluidic device. Almost all nanofibers have been produced by electrospinning method with high voltage of powers. However, this technique has drawbacks about the difficulties for scaling-up and safe operation. This wet process of nanofibers we suggested here has a great potential for continuous and on-demand production of nanofibers and facile design of highly-functional nanofibers.

4. **Room Temperature Printable Metal Nanoink**
   
   **1/30 (Wed.) (15:20 ~ 15:45)**
   
   **Division / Position**: Research Core for Interdisciplinary Sciences / Assistant Professor
   
   **Lecture Abstract**: Low temperature fabrication of reliable electrical circuits with electroconductive solution material is indispensable for modern printed electronics. The search for solution-based electron conductive materials that provide simultaneously high electron conductivity and convenient room temperature deposition is also an important research direction, with the resulting expectations of new technologies (such as flexible computers, large-area high-resolution displays and electronic paper) and lower-cost device fabrication. Stably solution soluble metal nanoparticles (NPs) are widely recognized for making metallic electrical circuit by printing process. However, the insulating nature of organic ligands on metal NPs results in quite poor interparticle carrier transport property. Relatively high temperature over 150 ° C. annealing process is necessary in order to remove the ligands. Here we show that m-junction gold nanoparticles drastically improve the interparticle carrier transport property. By ambient condition deposition of the aqueous solution of Au NPs gives electron conductive metallic thin film without any further post treatment.

If you have any inquiry, please contact us.
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