Status of Graphene Research and Industry in Thailand

Adisorn Tuantranont

Thai Organic and Printed Electronics Innovation Center (TOPIC), National Electronics and Computer Technology Center (NECTEC), National Sciences and Technology Development Agency (NSTDA), Thailand

adisorn.tuantranont@nectec.or.th, www.graphenethailand.com

ABSTRACT

Graphene, emerging as a true 2-dimensional material, has received increasing attention due to its unique physicochemical properties (high surface area, excellent conductivity, high mechanical strength, and ease of functionalization and synthesis). Printed Electronic also is a new wave of large-area electronics and flexible electronics manufactured by printing technology. Thailand can catch the opportunity using the fusion of these two emerging technologies. With the complete infrastructure from upstream to downstream industries from Petrochemical, Chemical Synthesis, Printing and Electronics Industry, it is sufficient to start development of graphene industry in Thailand. This invited talk is about to show how to synthesize graphene and use as a conductive ink for fabrication of transparent conductor in printed electronics. Also the applications in novel nanosensors that has higher sensitivity and lower detection limit and applications [1] in field of graphene composite [2] are presented. The recent activities of graphene research and industry in Thailand including graphene-related Startups, graphene cluster/consortium and the roadmap of Graphene Thailand will be presented.

Keywords: Graphene; Sensor; Synthesis, Composite, Printed Electronics

References:

[1] C. Srichan, M. Ekpanyapong, M. Horprathum, P. Eiamchai, N. Nuntawong, D. Phokharatkul, P. Danvirutai, E. Bohez, A. Wisitsoraat, A. Tuantranont*, "Highly-Sensitive Surface-Enhanced Raman Spectroscopy (SERS)-based chemical sensor using 3D graphene foam decorated with silver nanoparticles as SERS substrate", ***Scientific Reports***, Volume 6, 29 March 2016, Article number 23733.

[2] C. Sriprachuabwong, S. Duangsripat, K. Sajjaanantakul, A. Wisitsoraat, A. Tuantranont*, "Electrolytically exfoliated graphene-polylactide-based bioplastic with high elastic performance", ***Journal of Applied Polymer Science***, Volume 132, Issue 6, 1 February 2015, Article number 41439.

Figures:

Graphene conductive Ink by Innophene (Haydale Thailand) and Graphene-based Electrochemical Biosensors researched and commercialized in Thailand.

Speaker Biography

Dr. Adisorn Tuantranont
Director, Thai Organic and Printed Electronics Innovation Center (TOPIC)
National Electronics and Computer Technology Center (NECTEC)
Email: adisorn.tuantranont@nectec.or.th Website: http://www.graphenethailand.com

Dr. Adisorn Tuantranont received B.S. degree in Electrical Engineering from King Mongkut's Institute of Technology Ladkrabang (KMITL) in 1995 and the M.S. and Ph.D. degrees in Electrical Engineering (Photonics and MEMS) from University of Colorado at Boulder in 2001. From 2001-1014, he has been the Lab director of Nanoelectronics and MEMS Laboratory, National Electronic and Computer Technology Center (NECTEC) in Thailand. Since 2012, he found and works as Director at Thai Organic and Printed Electronics Innovation Center (TOPIC), NSTDA. His research interests are in the area of Micro/Nano-Electro-Mechanical Systems (MEMS/NEMS), Microfabrication, Advanced Material eg. Graphene, Nanotube, Nanowire, Nanoelectronics, Lab-on-a-chip and Printed Electronics Technology. He authors more than 110 refereed journal papers and 300 international proceeding papers including 1 International PCT patent, 5 granted Thai patents and more than 25 patents holding. He has been awarded Young Technologist Award in 2004 from Foundation for the Promotion of Science and Technology under the Patronage of H. M. the King. Now he is a member of Thai Academy of Science and Technology Foundation and Thailand Research Fund. He also actively works as Executive Advisor at Thailand Advanced Institute of Science and Technology (THAIST), National Science Technology and Innovation Policy Office, Ministry of Science and Technology of Thailand. He is co-founder of two startup companies, Innophene, graphene conductive ink manufacturer and ThaiKK Tech, smart label manufacturer, in Thailand. He also is founder of Graphene Thailand, the first graphene research community and networking cluster in Thailand. From 2016, he is elected to be General Secretary of Materials Research Society of Thailand (MRS-Thailand).