

UCSD NANOENGINEERING/CHEMICAL ENGINEERING
SPECIAL SEMINAR

Tuesday, August 27, 2019

Seminar Presentation: 2:00pm – 3:00pm

SME room 248**“Graphene Oxide Liquid Crystal towards Real World Graphene Applications”****Professor Sang Ouk Kim**

KAIST Chair Professor in the Department of Materials Science and Engineering at KAIST (South Korea), and the director of National Creative Research Initiative Center for Multi-Dimensional Directed Nanoscale Assembly and Graphene Liquid Crystalline Fiber Center

Abstract: Graphene Oxide Liquid Crystal (GOLC) is a newly emerging graphene-based material, which exhibits nematic type colloidal discotic liquid crystallinity with the orientational ordering of graphene oxide flakes in good solvents, including water. Since our first discovery of GOLC in aqueous dispersion ^[1], this interesting mesophase has been utilized over world-wide for many different application fields, such as liquid crystalline graphene fiber spinning, highly ordered graphene membrane/film production, prototype liquid crystal display and so on ^[2,3]. Interestingly, GOLC also allow us a valuable opportunity for the highly ordered molecular scale assembly of functional nanoscale structures. This presentation will introduce our current status of GOLC research particularly focusing on the nanoscale assembly of functional nanostructures. Besides, relevant research works associated to the nanoscale assembly and chemical modification of various nanoscale graphene-based materials will be presented particularly aiming at energy and catalytic applications ^[4,5].

References

- [1] J. E. Kim, T.H. Han, S.H. Lee, J.Y. Kim, C.W. Ahn, J.M. Yun, S.O. Kim, *Angewandte Chemie International Edition*, 50, 3043 (2011).
- [2] R. Narayan, J.E. Kim, J.Y. Kim, K.E. Lee, S.O. Kim, *Advanced Materials*, 28, 3045 (2016); S. P. Sasikala, J. Lim, I. Kim, H. J. Jung, T. Y. Yun, T. H. Han, S. O. Kim, *Chemical Society Reviews* 47, 6013 (2018).
- [3] J.Y. Kim, S.O. Kim, *Nature Materials*, 13, 325 (2014).
- [4] U. N. Maiti, W. J. Lee, J. M. Lee, Y. T. Oh, J. Y. Kim, J. E. Kim, J. W. Shim, T. H. Han, S. O. Kim, *Advanced Materials*, 26, 40 (2014).
- [5] S. H. Lee, D. H. Lee, W. J. Lee, S. O. Kim, *Advanced Functional Materials*, 21, 1338 (2011).

Biosketch: Prof. Sang Ouk Kim is the KAIST Chair Professor in the Department of Materials Science and Engineering at KAIST (South Korea), and the director of National Creative Research Initiative Center for Multi-Dimensional Directed Nanoscale Assembly and Graphene Liquid Crystalline Fiber Center. Prof. Kim’s research interest is focusing on directed molecular assembly of various nanoscale materials as a novel synthetic platform for new material discovery. Prof. Kim has published more than 210 SCI journal papers and delivered more than 370 invited presentations over worldwide. Prof. Kim is also serving as an associate editor of *Energy Storage Materials* (elsevier) and editorial board members for many scientific journals published by RSC, ACS, Wiley, Elsevier, Springer, etc. His research group is actively researching on the nanoscale assembly & chemical modification of various nanomaterials including carbon nanotubes and graphene as well as block polymer self-assembly for advanced nanoscale surface patterning.