



Prof. Ying Wang

Changchun Institute of Applied Chemistry,
Chinese Academy of Sciences, China

Special Guest Seminar

Theoretical Studies on Controllable Growth of Low-dimensional Carbon Materials and their Applications

OCT 23 | Bldg. 101
2PM TUE | Seminar Room on the 1st floor

Abstract: A major challenge in the applications of low-dimensional carbon materials (fullerene, carbon nanotube, graphene, and C_4H) is their controllable synthesis with identical chirality or diameter, metallic or semiconducting properties, and layers. In this report, I will talk about the influences of the structures or the sizes or the types of catalysts, the flux or the species of carbon sources, and the template (organic molecules and cloning), as well as the temperature in the chemical vapor deposition (CVD) synthesis process[1]. In addition, I will also focus on the catalytic properties of low-dimensional carbon materials in oxygen reduction reactions (ORR) at the cathode in full cells [2], Li-O₂ cell [3], Li-S cell [4], and dye-sensitized solar cells [5], as well as organo-catalysis [6] and molecule motor [7]. The achievements are expected to provide important theoretical basis and guidance for designing inexpensive, durable, and efficient new low-dimensional carbon-based catalyst and development of controllable synthesis of carbon materials.

Reference:

- [1] J. Am. Chem. Soc. 2011, 133: 18837; Adv. Funct. Mater. 2013, 23: 1628; Carbon, 2017, 121: 29 2; Carbon 2017, 114, 635; Nanoscale 2016, 8, 3067;
- [2] Nat. Commun., 2017, 8: 15938; Carbon 2017, 114: 393; J. Phys. Chem. C 2016, 120: 8804; J. P hys. Chem. C. 2017, 121: 3911;
- [3] Adv. Mater. 2016, 28: 9620
- [4] Electrochim. Acta 2018, 269: 83;
- [5] Chem. Eng. J. 2018, 349: 782; J. Mater. Chem. A, 2017, 5: 5952
- [6] Green Chem. 2016, 18: 4254; Chem. Eng. J. 2017, 330: 880; Carbon 2017, 121:443.
- [7] ACS Nano, 2017, 11, 10236

Ying Wang is Associate Professor in State Key Laboratory of Rare Earth Resource Utilization, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, China. Her research interests focus on: (1) Dynamic simulations on the controllable growth of low-dimensional carbon materials; (2) Applications of low-dimensional carbon materials in environmental, renewable energy and electrochemical systems. She is the author and co-author of around 100 papers on international journals including Nat. Commun., J. Am. Chem. Soc., ACS Nano, Adv. Mater. etc.

You are cordially invited to attend!