

International Conference on

NANOSCIENCE & TECHNOLOGY

May 21-22, 2018 | New York, USA

Development of chemical treatments to improve processability of carbon nanomaterials (carbon nanotubes and graphene)

Nawal Berrada

CNRS-University of Lorraine, France


Carbon nanostructures such as carbon nanotubes (CNTs) and graphene are impressive materials thanks to their remarkable properties: lightness, high chemical stability, strengthness (100-300 times stronger than steel), high specific surface area, high thermal and electrical conductivity. Thus, the possible application fields of carbon nanomaterials are numerous, for instance, mechanics, medicine, electronics. They are now available in high quantity at competing prices thanks to the development of scale-up synthesis methods, in recent years. However, chemical conversion of carbon precursors to CNTs by Chemical Vapor Deposition (CVD) requires metal catalysts that inevitably remain in the as-produced samples. Moreover, both CNTs and graphene being hydrophobic are highly difficult to process. They have tendency to aggregate and restack, which leads to a dramatic decrease of performances. In order to fully benefit of their outstanding properties to develop new materials or devices, well-adapted and efficient post-synthesis chemical treatments have to be applied to these carbon nanomaterials. Particularly, we have precisely

investigated their purification and functionalization. Our one-step and gas-phase purification treatment is efficient to prepare super-pure carbon nanotubes. Their covalent and/or non-covalent surface modifications has been controlled thanks to complementary techniques. We will show how these chemical treatments can be useful for further practical utilization of these carbon nanomaterials.

Speaker Biography

Nawal Berrada completed her Master in 2016 after a project related to the recovery of precious metals from jewelry waste. She has also developed a green alternative method to clean jewels without cyanide-based chemicals under the supervision of Dr. E. Meux at University of Lorraine, Metz. She started her PhD in 2016 at the Institut Jean Lamour (University of Lorraine, CNRS, Nancy) under the mentorship of Dr. A. Desforges and Dr. B. Vigolo. Her work is centered around developing chemical processes on carbon nanomaterials for the purpose of overcoming processing issues. Her activities are mainly devoted to carbon nanotubes and graphenic materials for their selective purification, surface modifications, dispersion and processing. She has developed efficient and innovative chemical treatments to CNTs and her current activities are focused on the further use of the prepared CNTs and graphene, especially as nanofluids for heat transfer improvement.

e: nawal.berrada@univ-lorraine.fr

 Notes: