

Enhancing Composite Materials with Functionalized Graphene & CNTs

Presenting Author, J. Patrick Frantz

Haydale Technologies (Thailand) Co., Ltd.
Thailand Science Park, Phaholyothin Road 111
Khlung Luang District, Pathum Thani 12120
jpfrantz@haydale.com

Abstract

Tremendous industry interest in novel carbon materials has developed over the past 25 years, first with the discovery of carbon nanotubes (CNTs) in the early nineties and then again with the isolation and characterization of graphene that led to a Nobel Prize in Physics in 2010. However, industry players both small and large are still struggling with the challenge of putting these materials into real products. One of the primary obstacles has been with the hydrophobic nature of these materials that lead to poor dispersion, making them difficult to use in many applications – such as composite materials. Haydale has developed a low-temperature plasma process for the treatment and functionalization of both CNTs and graphene that can promote better dispersion into a variety of targets and that can help unlock the full potential of these materials. Third-party work by the Aerospace Corporation has shown the benefit of Haydale's functionalization process in epoxy resins [1], and this talk will present further data showing how functionalization of CNTs and graphene can lead to higher performance in a variety composite materials.

References

[1] RJ Zaldivar et al., Journal of Applied Polymer Science , **Volume 131, Issue 18** (2014) p. 40978.

Figures

Author Bio

J. Patrick Frantz received BA (1995) and MEE (1997) degrees from Rice University and returned to Rice in 1999 to serve as the Executive & Technical Director for the Center for Multimedia Communications. In 2006 he was awarded the Outstanding Young Engineering Alumnus award for his efforts in international engineering education. Shortly thereafter, Patrick moved to Japan, working in the semiconductor and display industries (Xilinx, Barco and UniPixel Displays) and receiving an MBA from Temple University Japan in 2011. He founded planarTECH in 2012 and has since been active in the field of graphene and other emerging 2D materials, including serving as Haydale Limited's Asia Representative since May 2014 and a director of Haydale Technologies (Thailand) Co., Ltd. since September 2016.