Research & Reviews: Journal of Material Sciences

October 2018 | Volume 6 | ISSN: 2321-6212

Proceedings of

31ST MATERIALS SCIENCE AND ENGINEERING CONFERENCE: ADVANCEMENT & INNOVATIONS

October 15-17, 2018

Helsinki, Finland

31ST MATERIALS SCIENCE AND ENGINEERING CONFERENCE: ADVANCEMENT & INNOVATIONS

October 15-17, 2018 Helsinki, Finland

Keynote Forum (Day 1)

conferenceseries.com

Allan D Boardman, Res. Rev. J Mat. Sci. 2018, Volume 6
DOI: 10.4172/2321-6212-C5-025

31st Materials Science and Engineering Conference: Advancement & Innovations

October 15-17, 2018 Helsinki, Finland

Allan D Boardman

University of Salford, UK

Dramatic new rogue and solitonic pathways controlled by meta-materials

Advanced meta-materials are now becoming popular artificial materials that can deploy complex graphene structures and uniaxial layered dielectric creations. Layered sub-wavelength systems are experimentally attractive and relatively, easily controlled compared to the classic double negative devices. New pathways for advanced meta-materials clearly involve solitons but in the nonlinear domain rogue waves deliver a dominant interest. These are shown here to lead to novel, dramatically exciting behavior. It will be shown how, in addition to meta-material controlling influence, nonlinearity and elegant magneto-optic control can be readily included, through a novel methodology based around forms of the nonlinear Schrödinger equation that include stationary and non-stationary effects. It can be, often, difficult to generate the Schrodinger equation for advanced substances like hyperbolic meta-materials but the developments shown here, based upon type II hyperbolic, readily permit the investigation of both temporal and spatial solitons. Additionally, the possibility of terahertz wave amplification, based upon graphene, with inverse population of carriers in the epsilon-near-zero regime is demonstrated. Type II meta-materials will be fully investigated with the inclusion of nonlinear, non-stationary diffraction and dispersion. Rogue waves have captured interest in a broad band of areas because of their hydrodynamic origin and here we will pursue new electromagnetic pathways. New types of soliton interaction devices will also be presented alongside this fascinating discussion of rogue waves. It will be shown that, when symmetry is an issue, the optic axis must always be in a carefully frozen position in any realistic application. It is quite dramatic that its position could overwhelm absorption. Controlled generation of high-intensity single- or multi- rogue waves will be demonstrated by induced modulation instability leading to some new broad-based applications, especially in the biological domain.

Biography

Allan D Boardman from the UK University of Salford is a worldwide Expert on the Global Revolution known as meta-materials that is now transforming science. He was the Co-Chair of this huge meta-material conference under the photonics Europe heading. He holds a Doctor of Science degree from the University of Durham and is responsible for 328 peer-reviewed and other publications, generating 5432 citations. He has been Topical Editor for the Journal of the Optical Society of America B for meta-materials. He is a Fellow of the SPIE and a Fellow of the Optical Society of America. He is also a Fellow of the UK Institute of Physics and the Institute of Mathematics and its Applications.

A.D.Boardman@salford.ac.uk

Notes:

conferenceseries.com

31ST MATERIALS SCIENCE AND ENGINEERING CONFERENCE: ADVANCEMENT & INNOVATIONS

October 15-17, 2018 Helsinki, Finland

Keynote Forum (Day 2)

Vincent Lapinte, Res. Rev. J Mat. Sci. 2018, Volume 6
DOI: 10.4172/2321-6212-C5-025

31ST MATERIALS SCIENCE AND ENGINEERING CONFERENCE: ADVANCEMENT & INNOVATIONS

October 15-17, 2018 Helsinki, Finland

Vincent Lapinte

Charles Gerhardt Institute, France

Lipidic additives for polymeric materials

Facing the toxicity of many plastics and the increasingly drastic regulations, many studies on novel additives, especially bio-based additives for polymers are sought. Herein, we illustrated this keen interest with bio-based plasticizers and surfactants as alternatives to phthalate plasticizers and nonylphenol ethoxylated surfactants, respectively. Poly(vinylchloride) (PVC) is one of the most attractive industrial plastics (biomedical, textile industry, plastic toys, packaging) because available as rigid or soft materials. In the latter case, flexibility and processability come from a plasticizer-additive in high amount (30-50 %w/w). Nowadays, the most widespread plasticizers are the phthalates even if severe public health-care issues as reprotoxic and endocrine disruptor effects are attested. Most of phthalates will be banned by standards and regulations (Reach Annex XIV). In our lab, two generations of phthalate-free plasticizers have been developed using green chemistry. Phosphonated lipids prove to be an efficient additive as primary plasticizers for PVC as well as flame retardants. Otherwise, cardanol-based plasticizers of PVC reach good PVC plasticizing properties and reveal no impact on environment and no endocrine perturbation activity. These results are attractive in order to replace phthalates in soft PVC formulation industry. Among the nonionic surfactants, Nonylphenol Ethoxylated (NPE) has widely demonstrated their efficiency even if a high toxicity to aquatic organisms was proved. Regarding the many sectors including textile processing, pulp and paper processing, paints, resins and protective coatings, oil and gas recovery in which they were employed, substituents seem to be a major issue. It has been reported that the ethoxylation of cardanol, bio-sourced lipidic phenol, produced a nonionic surfactant characterized by a low biodegradability. Inspired by these results, we investigated a series of surfactants based on cardanol and Polyoxazoline (POx) technology knowing the POx are well-known to be an alternative to PEG.

Biography

Vincent Lapinte is an Assistant Professor at the Polymer Department of the Institute of Materials Charles Gerhardt of Montpellier (ICGM-France). His area of expertise concerns the bio-based polymers especially peptides and pseudo-peptides such as polyoxazolines regarding synthesis and self-assembly aspects. Bio-based building blocks for polymers were also investigated. He has published more than 50 papers in reputed journals and 7 patents. He also has Co-Supervised 18 PhD and 12 post-doctoral.

vincent.lapinte@umontpellier.fr

Notes: