

Twentieth International Symposium on Processing and Fabrication of Advanced Materials (PFAM XX)



December 15-18, 2011, Hong Kong
"Pearl of the Orient"

Organized by the Department of Mechanical Engineering at The Hong Kong Polytechnic University, Hong Kong, the Twentieth International Symposium on Processing and Fabrication of Advanced Materials (PFAM XX) is to be held December 2011. The primary purpose of this inter-disciplinary symposium is to bring together state-of-the-art developments on all aspects related to the processing and fabrication of advanced materials spanning the entire spectrum of metallic, intermetallics, ceramics, ceramic-matrix composites, metal-matrix composites, intermetallic-matrix composites, advanced polymers and polymer-matrix composites, and including surface and high-temperature coatings. The symposium will certainly provide an attractive forum for presenting the *latest advances* in materials processing and fabrication by researchers and engineers from industry, research laboratories and academia.

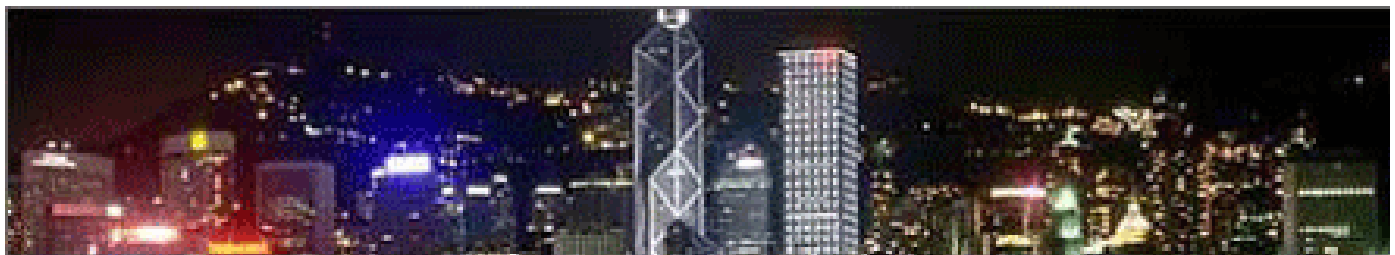
Key-Note and **Invited** papers from "leading-edge" academic and industrial research settings, in related areas, will provide a lucid and comprehensive overview of the current status and potential future directions for research. **Contributed** papers will attempt to cover specific problems in the same areas. The topics of interest include, but are not restricted to:

- Advanced Composite Materials (Polymer, Metal and Ceramics)
- Natural Fibre (Plant or Animal based) Composites
- Nano-structural Materials
- Properties of Materials
- Failure Analysis
- Computational Analysis and Simulations
- Advanced Manufacturing Processes
- Bio-materials and Bio-composites
- Materials Characterizations



PUBLICATION OF PROCEEDINGS

All of the **KEY-NOTE**, **INVITED** and **CONTRIBUTED** technical papers presented at the symposium will be published in the proceedings. Instructions for manuscript preparation and submission will be provided to the authors whose abstracts have been accepted for participation in the event. Contributing authors are urged and encouraged to plan ahead so as to ensure that the manuscripts will be completed by the tentative deadline date of **August 15 2011**.



SYMPOSIUM Chairman

Professor Alan K.T Lau

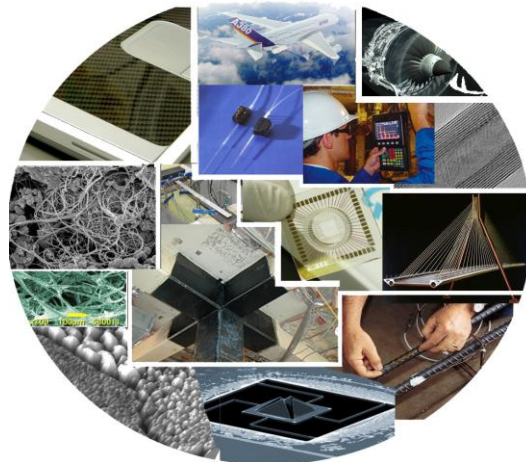
The Hong Kong Polytechnic University, Hong Kong
The University of Southern Queensland, Australia
Tel: (852) 2766 7730; (61) 7 4631 1336
Fax: (852) 2365 4703; (61) 7 4631 2110
Email: Kin-tak.Lau@usq.edu.au

Symposium Co-Chairmen

Professor Ming Qiu Zhang (Zhongshan University, China)

Professor Debes Bhattacharyya (The University of Auckland, New Zealand)

Professor T. S. Srivatsan (The University of Akron, USA)



Symposium Secretary:

Miss **Mabel Ho** (The University of Southern Queensland, Australia)

THE KEY-DATES TO REMEMBER

- ▶ Abstract Submission Deadline: Jun 01, 2011
- ▶ Acceptance of Abstracts: June 15, 2011
- ▶ Submission of Final Manuscript: August 15, 2011
- ▶ Conference Proceedings: On-site



Abstracts submitted for consideration should be roughly 150-200 words and relevant to the topic for which the presentation is being submitted; the proposed title, conclusions and significance of the presentation; and, the following information about the presenter and all co-presenters: name, title, company/affiliation, complete address, phone and fax number, and e-mail address.

Registration Fee:

Full Registration: US\$ 500 (Before 31 July 2011); US\$ 550 (After 31 July 2011); US \$570 (On-site Registration). Full conference package includes daily lunch, tea reception, Gala dinner and one copy of the conference proceedings.
Student Registration: US\$ 250 (Before 31 July 2011); US\$ 280 (After 31 July 2011). The student is required to present a valid photo "Student University ID" when they check in at the Conference.



Conference Information:

If you have any enquiry, please visit our official website: <http://www.a-tech.hk/PFAM2011/Index.htm> or contact the Conference Chair/Secretary directly via Kin-tak.Lau@usq.edu.au / w0100063@uamail.usq.edu.au.

"Research is to see what everybody else has seen, and to think what nobody else has thought" by Albert Szent-Gyorgi (1893-1986)

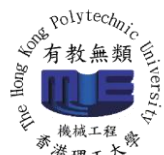
Supporting Organizations:



Centre for Advanced
Composite Materials



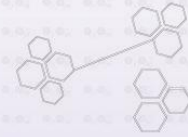
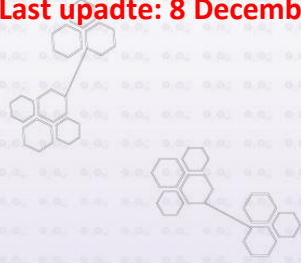
CENTRE OF EXCELLENCE IN
ENGINEERED FIBRE COMPOSITES



The Hong Kong
Polytechnic University

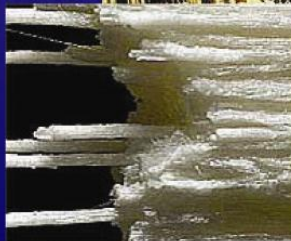


Last update: 8 December 2011



The Twentieth International Symposium on Processing and Fabrication of Advanced Materials (PFAM XX)

Program and Abstract Book



- Advanced Composite Materials
- Natural Fibre Composites
- Nano-structural Materials
- Properties of Materials
- Failure Analysis
- Computational Analysis and Simulations
- Advanced Manufacturing Processes
- Bio-materials and Bio-composites
- Materials Characterizations

December 15 -17, 2011, Hong Kong
“ Pearl of the Orient”



16 December 2011 (Friday)

Room Y 301

- 8:30 am Registration
- 9:00 am Welcoming Speech
Professor Alan K. T. Lau
(The Hong Kong Polytechnic University), Conference Chairman
- 9:15 am Opening Speech
Professor Cheng Li
(Head, Department of Mechanical Engineering, The Hong Kong Polytechnic University)

Room Y 301

- Keynote Lectures
Chair: Debes Bhattacharyya (University of Auckland, New Zealand)
- 9:30 am John P Gyekenyeski (*NASA Glenn Research Centre, USA*)
Potential Composite Structures for NASA Future Launch Vehicle and Crew Spacecraft [Paper 88]
- 10:15 am Nobuo Takeda (*University of Tokyo, Japan*)
Life Cycle Monitoring of Curved Composite Parts using Embedded Fibre Bragg Grating Sensors [Paper 89]
- 11:00 am Tea Break
- Keynote Lectures
Chair: Yan Li (Tongji University, China)
- 11:15 am Alan Crosky (*University of New South Wales, Australia*)
Grading of Biofibres for use in Natural Fibre Composites [Paper 92]
- 12:00 nn Ben Wang (*Florida State University, USA*)
Multifunctional Nanomaterials for Alternative Energy [Paper 90]
- 1:15 pm Lunch

16 December 2011 (Friday)

2:30 pm to 4:30 pm

Session (1) – Room Y301

Chairs: Narongrit Sombatsompop (*Univ. of Tech. Thonburi*) and Joong-hee Lee (*Chonbuk Nat. Univ.*)

- 2:30 pm INVITED LECTURE
Plant Fibre Reinforced Composites and Their Applications [Paper 94]
Yan Li
- 3:10 pm Effect of Wood Flour on Structural and Thermal Properties and Antibacterial Activity of PLA Filled with Triclosan [Paper 27]
Chana Praprudivongs and Narongrit Sombatsompop
- 3:30 pm Anti-fungal and Anti-algal Performances of Biocides filled PVC and Wood/PVC Composites [Paper 33]
Apisit Kositchaiyong and Narongrit Sombatsompop
- 3:50 pm Supramolecular Polymers for Potential Biomedical Applications [Paper 56]
Jun Li
- 4:10 pm A Study on the Dynamic Mechanical Properties of Silk Fibre Composites [Paper 82]
Mei-po Ho, Hao Wang, Chun-kit Ho and Kin-tak Lau

Session (2) – Room Y302

Chairs: Alan Crosky (*UNSW*) and Yan Li (*Tongji Univ.*)

- 2:30 pm Europium Complex with Functionalized Carbon Nanotubes: A New Lanthanide Photoluminescence Nanomaterial [Paper 4]
Xiao-Feng Li, Yan An, Kin-Tak Lau, Wen-Ge Li and Yan-Sheng Yin
- 2:50 pm On the Influence of Carbon nanotubes and Processing on Tensile Response and Fracture Behaviour of A Magnesium Alloy [Paper 13]
T.S. Srivatsan, C. Godbole, M. Paramsothy and M. Gupta
- 3:10 pm Study on the effect of thickness on structural and optical properties of nanocrystalline bismuth ferrite (BiFeO₃) thin films [Paper 79]
Soram Bobby Singh, Ng Boinis Singh and H B Sharma
- 3:30 pm Interfacial Bonding in a Nanoclay/Polymer Composite [PAPER 83]
Mo-lin Chan, Kin-tak Lau and T.T.Wong
- 3:50 pm Effect of MWCNT on Mechanical Properties of γ -irradiated UHMWPE during Shelf Ageing Process [Paper 97]
P S Rama Sreekanth, N Naresh Kumar and S Kanagaraj
- 4:10 pm Characterization of Polystyrene (PS)/Organomodified Layered Double Hydroxide (OLDH) Nanocomposites Prepared by *in situ* Polymerization [Paper 98]
Balakrushna Sahu and G. Pugazhenthii

16 December 2011 (Friday)

2:30 pm to 4:30 pm

Session (3) – Room Y 303

Chair: T. S. Srivatsan (*Univ. Akron*) and Jung-il Song (*Changwon National Univ.*)

- 2:30 pm The Influence of Processing on Micro-structural Development, Tensile Response and Fracture Behaviour of Aluminum Alloy 5083 [Paper 5]
Troy D. Topping, Ying Li, and Enrique J. Lavernia, K. Manigandan and T. S. Srivatsan
- 2:50 pm Developing Corrosion-resistant Joints Applied in the Plate Heat Exchanger [Paper 7]
C.H. Hsu, H.W. Hsu, T.Y. Yeh, W.S. Chen and R.K. Shiue
- 3:10 pm Effect of Tool Angle On Friction Stir Welding of Aluminum Alloy 5052: Role of Sheet Thickness [Paper 14]
P. Jayachandra Reddy, Satish V. Kailas and T. S. Srivatsan
- 3:30 pm The Extrinsic Influence of Tool Plunge depth on Friction Stir Welding of an Aluminum Alloy [Paper15]
K. Kandasamy, S. V. Kailas and T. S. Srivatsan
- 3:50 pm Effect of h-BN Content on the Sintering of SS316L/h-BN Composites [Paper 40]
S. Mahathanabodee, T. Palathai, S. Raadnui, R. Tongsrri and N. Sombatsompop
- 4:10 pm Adsorption of Ammonium Sulfate using Fabricated Zeolite from Waste Sludge of Water Treatment Plant [Paper 42]
Kwannate Sombatsompop, Thun Jeensawak, Pongsachan Sonpai, Adithep Wangbooncong, Jeatana Wongwichien and Suwimol Asavapisit

4:30 pm to 4:50 pm Tea Break

16 December 2011 (Friday)

5:00 pm to 7:00 pm

Session (4) – Room Y301

Chairs: Richard J. T. Lin (*Univ. Auckland*) and Y. S. Choy (*Hong Kong Polytechnic Univ.*)

- 5:00 pm Synthesis and Characterization of Al-alloy/SiC_p Nanocomposites Employing High Energy Ball Milling and Spark Plasma Sintering [Paper 48]
Sivaiah Bathula, R.C. Anandani, Ajay Dhar and A.K. Srivastava
- 5:20 pm Modeling of Anisotropic Plastic Behavior of Advanced High Strength Steel Sheet TRIP 780 [Paper 59]
Sansot Panich, Vitoon Uthaisangasuk, Surasak Suranuntchai and Suwat Jiratheararat
- 5:40 pm Effect of Cryogenically Treated Electrode during AEDM of Nickel Based Super Alloy 718 for Surface Quality Improvement [Paper 60]
Anil Kumar, Sachin Maheshwari and Chitra Sharma
- 6:00 pm Evaluation of Surface Quality During Electrical Discharge Machining of Inconel 718 with Powder Metallurgy Electrodes [Paper 65]
Naveen Beri, Sachin Maheshwari and Chitra Sharma
- 6:20 pm Optimization of the Process Parameters for Drilling of Metal Matrix Composites (MMC) Using Taguchi Analysis [Paper 68]
Sarbjit Singh, Abhishek Singh, Inderdeep Singh and Akshay Dvivedi
- 6:40 pm The Effect of Mn Addition on the Microstructure and Mechanical Properties of Gas- atomized Al-20Si-5Fe-3Cu-1Mg Powder [Paper 71]
P. Moazzenipoor, M. Rajabi and P. Davami

Session (5) – Room Y302

Chairs: Mabel M. P. Ho (*Univ. Southern Queensland*) and Ben Wang (*Florida State University, USA*)

- 5:00 pm Study on Mechanical Properties of 2024 Al Sheet Treated by SMAT [Paper 106]
K.P. Cheung, J.Silbanus, S.Q. Shi and J. Lu
- 5:20 pm Finite Element Modeling for Hot Forging Process of AISI 4340 Steel [Paper 76]
Apichat Sanrutsadakorn, Vitoon Uthaisangasuk, Surasak Suranuntchai and Borpit Thossatheppitak
- 5:40 pm Comparative Study to Analyze the Effect of Tempering During Cryogenic Treatment of Tungsten Carbide Tools in Turning [Paper80]
Nirmal S Kalsi, Rakesh Sehgal and Vishal S Sharma
- 6:00 pm Magnesium Matrix Composites: State-of-the-art and What's the Future [Paper 86]
Hajo Dieringa and Karl Ulrich Kainer
- 6:20 pm Burr Size Reduction in Drilling of Al/SiC Metal Matrix Composite by Ultrasonic Assistance [Paper 96]
M. A. Kadivar, R. Yousefi, J. Akbari and A. Rahi
- 6:40 pm Deformation Mechanism Maps for Al-Cu-Mg alloys micro-alloyed with Tin [Paper 102]
P.S. Robi, Sanjib Banerjee and A. Srinivasan

16 December 2011 (Friday)

5:00 pm to 7:00 pm

Session (6) – Room Y 303

Chairs: Min Wang (*Hong Kong Univ.*) and Jinsong Leng (*Harbin Institute Tech*)

- 5:00 pm INVITED SPEAKER
Compressive Strength Characterization of Polyester Based Fillers [Paper 26]
Mainul Islam
- 5:20 pm Duct Noise Control by using very Light Composite Plate [Paper 91]
Y. S. Choy, Y. Liu and K. T. Lau
- 5:40 pm Dynamical Response of Sandwich Plates with Strength Graded Cores to Blast Loading [Paper 29]
B. Yu, F.X. Xin and T.J. Lu
- 6:00 pm Numerical Simulations for Hail Impact on Lightweight Sandwich Structures [Paper 30]
B. Han, F.X. Xin, F. Jin and T.J. Lu
- 6:20 pm UV Weathering Effect on Antibacterial Performance in Silicone Rubber Compounds [paper 31]
Kulnida Taptim and Narongrit Sombatsompop
- 6:40 pm Tribological Properties of Flame Sprayed Hexagonal Boron Nitride/Polyetheretherketone Coatings [paper 39]
Tharajak, J, Palathai, T and Sombatsompop N

17 December 2011 (Saturday)

Room Y 301

Keynote Lectures

Chair: Nobuo Takeda (*University of Tokyo*)

8:30 am Oleg L Figovsky (*International Nanotechnology Research Centre Polymate, Israeli*)

Preparing Polymer Nano-membranes by SDP Method [Paper 93]

9:15 am Changchun Ge (*Chinese Academy of Science, China*)

Compressive Strength Characterization of Polyester Based Fillers [Paper 116]

10:00 am Tea Break

Room Y 301

Keynote Lectures

Chair: Alan K. T. Lau (*Hong Kong Polytechnic Univ.*)

10:15 am Debes Bhattacharyya (*University of Auckland, New Zealand*)
Sandwich Films with Electrospun NanoFibre Cores Containing Graphene Oxide [Paper 101]

11:00 am Paul K. L. Yu (*University of California, USA*)
Advances in Semiconductor Nanostructures for Photonic Applications [Paper 117]

11:45 am Jinsong Leng (*Harbin Institute of Technology, China*)
Multi-functional Soft Smart Materials and Their Applications [Paper 110]

12:30 pm Lunch

17 December 2011 (Saturday)

1:30 pm to 3:50 pm

Session (7) – Room Y301

Chairs: Eva Mo-lin Chan (*Hong Kong Polytech. Univ.*) and Xiao-feng Li (*Institute of Maritime Mater.*)

- 1:30 pm Molding of C-FRP Plate with using Induction Heating [Paper 78]
Eitoku Nakanishi, Seijiro Maki and Satonori Matsumoto
- 1:50 pm Compressive Behaviour of Glass Fibre Reinforced Plastic Laminates with Drilled Hole [Paper 70]
P. K. Rakesh, I. Singh and D. Kumar
- 2:10 pm Development and Characterisation of Lightweight Sandwich Panel for Table Tennis Table [Paper 85]
Anjaneya Prasad Penneru, Richard J.T. Lin^a, Paul Antcliff and Hansol Choi
- 2:30 pm Effects of PPV-g-PSFu Graft Copolymer on Morphology and Power Conversion Efficiency of Bulk Heterojunction Solar Cell Base on P3HT/ C₆₀ Blends [Paper 41]
Narumon Seepunkai, Jatuphorn Wootthikanokkhan and Chanchana Thanachayanont
- 2:50 pm Characterisation of Energy Generating PolyVinylidene Fluoride (PVDF) Based Piezoelectric Filament [paper 61]
D. Vatansever, R. L. Hadimani, T. Shah and E. Siores
- 3:10 pm Influence of Cations of Inorganic Compound in Two Different Electrolytes on Titanium Oxide Via Micro-Arc Oxidation [Paper 75]
Dong Hyuk Shin , You Chan Jung, Ki Ryong Shin, Sang Il Yoon

Session (8) – Room Y302

Chairs: Mainul Islam (*Univ. Southern Queensland*) and Fengxian Xin (*Jiaotong Univ.*)

- 1:30 pm Study of the Effect of Frequency in Pulse Electrodeposition on Au-Ni from Cyanide-citrate Electrolyte by the Aim of Design of Experiment [Paper 51]
R. Siavash. Moakhar, I. Imanieh, M. Ghorbani and A. Dolati
- 1:50 pm Effects of Emulsion Electrospinning Parameters on the Morphology and Structure of Core-shell Structured PLLA Fibers [Paper 66]
Xin Zhang and Min Wang
- 2:10 pm A Comparative Study on Conventional Electrospinning and Emulsion Electrospinning of PLLA Nanofibers [Paper 67]
Xin Zhang , Min Wang, Xiao-Yan Yuan and Jia-Chen Kang
- 2:30 pm Fire Performance of Flax Laminates and Their Hybrids [Paper 8]
S.Rao, A. Bhardwaj, A. Beehag and D. Bhattacharyya
- 2:50 pm Conventional Electrospinning vs. Emulsion Electrospinning: a Comparative Study on the Development of Nanofibrous Drug/Biomolecule Delivery Vehicles [Paper 58]
Chong Wang, Sze-Nga Tong, Yuk-Hang Tse, Min Wang
- 3:10 pm Welding Heat Transfer Analysis using Element Free Galerkin Method [Paper 114]
R. Das, K. S. Bhattacharjee and S. Rao
- 3:30 pm Influence of Carbon Nanotubes and Processing on Cyclic Fatigue and Final Fracture behavior of a Magnesium Alloy [Paper 12]
T. S. Srivatsan, C. Godbole, M. Paramsothy and M. Gupta

17 December 2011 (Saturday)

1:30 pm to 3:30 pm

Session (9) – Room Y 303

Chairs: Jun Li (*NUS*) and R. K. Shiue (*National Taiwan Univ.*)

- 1:30 pm Spandex Fiber Reinforced Shape Memory Polymer Composites and Their Mechanical Properties [Paper 115]
Jian Sun, Yanyi Xu, Yijin Chen, Yanju Liu, Jinsong Leng
- 1:50 pm Assessing Heat-treatment Effects on Bovine Cortical Bones by Nanoindentation [Paper 84]
Mei-ling Lau, Kin-tak Lau, Harry Ku, Debes Bahattacharyya and Joong-Hee Lee
- 2:10 pm Formability evaluation of FSW blanks made of aluminum sheet: Influence of welding speed and tool rotation speed [Paper 103]
P. Janaki Ramulu, R. Ganesh Narayanan, Satish V. Kailas and Jayachandra Reddy
- 2:30 pm Cutting Model in Machining of Al/SiC_p Metal Matrix Composite [Paper 105]
S. M. Nikouei, R. Yousefi, M. A. Kouchakzadeh and M. A. Kadivar
- 2:50 pm Microwave Joining of Natural Fiber Reinforced Green Composites [Paper 69]
I. Singh, P. K. Bajpai, D. Malik, J. Madaan, N. Bhatnagar
- 3:10 pm Flexural Properties of Epoxy Composites filled with Glass Powder: Preliminary Results [Paper 11]
H Ku, P Wong, J Huang, H Fung and M Trada
- 3:30 pm Surface Treatment Influence on the Mechanical Behavior of Jute Fiber Reinforced Composites [Paper 111]
J.M. Byeon, G.B. Nam, J.W. Kim, B.S. Kim and J.I. Song

3:50 pm to 5:00 pm Poster Session

5:30 pm Gathering at Conference Venue to Dinner Venue

6:00 pm Gala Dinner

Fire Performance of Flax Laminates and their Hybrids 	p114
<i>S. Rao, A. Bhardwaj, Andrew Beehag, Debes Bhattacharyya</i>	
Conventional Electrospinning vs. Emulsion Electrospinning: A Comparative Study on the Development of Nanofibrous Drug/Biomolecule Delivery Vehicles 	p118
<i>Chong Wang, Sze Nga Tong, Yuk Hang Tse, Min Wang</i>	
Surface Treatment Influence on the Mechanical Behavior of Jute Fiber Reinforced Composites 	p122
<i>J.M. Byeon, Gi Beop Nam, J.W. Kim, B.S. Kim, Jung I. Song</i>	
Europium Complex with Functionalized Carbon Nanotubes: A New Lanthanide Photoluminescence Nanomaterial 	p129
<i>Xiao Feng Li, Yan An, Kin Tak Lau, Wen Ge Li, Yan Sheng Yin</i>	
On the Influence of Carbon Nanotubes and Processing on Tensile Response and Fracture Behavior of a Magnesium Alloy 	p133
<i>Tirumalai S. Srivatsan, C. Godbole, Muralidharan Paramsothy, Manoj Gupta</i>	
Study on the Effect of Thickness on Structural and Optical Properties of Nanocrystalline Bismuth Ferrite (BiFeO₃) Thin Films 	p142
<i>Soram Bobby Singh, Ng Boinis Singh, H. Basantakumar Sharma</i>	
Nafion-Peptized Laponite Clay Nanocomposite Membrane for PEMFC 	p148
<i>Ananta Kumar Mishra, Seon Hyeong Bae, Nam Hoon Kim, Kin Tak Lau, Joong Hee Lee</i>	
Preparation and Characterization of High Performance LLDPE/Graphene Nanocomposites 	p152
<i>Tapas Kuila, Bong Joo Jung, Xiao Fei Yi, Joong Hee Lee</i>	
Interfacial Bonding in a Nanoclay/Polymer Composite 	p156
<i>Mo Lin Chan, Kin Tak Lau, Tsun Tat Wong</i>	
Effect of MWCNT on Mechanical Properties of γ-Irradiated UHMWPE during Shelf Ageing Process 	
<i>P.S. Sreekanth, N.Naresh Kumar, S. Kanagaraj</i>	