Editorial

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Biographical notes: Jinghua Yin received her Doctor's degree in Harbin Institute of Technology (HIT) in 2001. Currently, she works at Harbin University of Science and Technology, Harbin, China as Professor and PhD Supervisor. She is Academic Leader of the key discipline of Heilongjiang Province as well as Harbin University of Science and Technology, Executive Director of Heilongjiang Physics Society, and Distinguished Teacher of China as well as Heilongjiang Province. She is interested in structure and property of inorganic nanohybride films, structure and failure of VDMOS devices, packaging structure and reliability of electronic devices. She is in charge of the project of National 863 Research Project and Natural Science Foundation of China. She has published more than 60 research papers, 20 of which are included in SCI and EI.

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This special issue comprises five selected and extended papers from the 2012 International Conference on Applied Materials and Electronics Engineering (AMEE 2012). The conference received 812 submissions from 14 countries and regions, of which 410 were selected for presentation after a rigorous review process; the guest editors selected five as the best papers on materials and product technology.

The 2012 International Conference on Applied Materials and Electronics Engineering (AMEE 2012) was held on January 18th and 19th, 2012 in Hong Kong. It was sponsored by the International Association for Scientific and High Technology and the International Science and Engineering Research Center, and co-sponsored by Trans Tech Publications. The conference continued the excellent tradition of gathering world-class researchers

and engineers engaged in the fields of applied materials, electronics engineering and computer technology to present their latest activities.

We would like to take this opportunity to thank the authors for the efforts they put in the preparation of the manuscripts and for their valuable contributions. We wish to express our deepest gratitude to the programme committee members for their help in selecting papers for this issue and especially the referees of the selected papers for their thorough reviews under a tight time schedule. Last, but not least, our thanks go to the editorial board of the *International Journal of Materials and Product Technology* for their exceptional efforts throughout this process.

'Electrostatic discharge simulation and experimental analysis of electrostatic control in electronic device manufacturing', by Anusorn Chakkaew and Wisut Titiroongruang, presents advanced material evaluations and considerations for electrostatic control in electronic device manufacturing to resolve factory issues. There are materials and system evaluations of electrostatic generation on personnel, personnel grounding through wrist strap, personnel grounding through real time wrist strap monitor, static control footwear and floorings evaluation, proper device handling materials, grounding, and static control surfaces selection. For machine grounding measurement in high frequency noise and long ground wires with associated inductance, the ground voltage on the tool will be significantly different from the one on the connected computer or another tool. Excessive voltage on the tools also can cause damage to electrostatic sensitive devices. The contact resistance experiment from non-standard small probes simulates resistance characterisation of static control surfaces needed for small and light devices. High contact resistance observed from the non-standard small probes show no electrostatic dissipation from the devices as the factory needed.

'Effect of various mixing properties of concrete on chloride penetration through cracks', by In-Seok Yoon, deals with the experimental examination on chloride penetration through micro-cracks characterised with the features of concrete mixing. In the paper, comprehensive experimental recipes were designed to examine the effect of cracks on chloride penetration. Both ordinary concrete and special mixed concrete were made. Cracks were generated depending on mixing properties such as a maximum size of coarse aggregate, high strength, and steel fibre. The method developed to create natural cracks is described, followed by a short explanation of the used non-steady state chloride migration test. From the chloride penetration profiles of concrete samples, the influence of the crack width, measured on the concrete surface exposed to chloride ions, on the maximum chloride penetration depth is investigated. This study is expected to provide us an insight into developing design criteria for making a durable concrete and in predicting service life of cracked concrete structure.

'Novel green illumination energy for LED with ocean battery materials', by Jung-Chang Wang, proposes the novel materials of LED with ocean battery. Ocean battery employs sea water existing in nature as energy to drive LED lamp lighting. The analysing methods are thermal-, electric- and illumination-performance experiments to discuss the novel green illumination techniques. Ocean battery and LED are all DC components, there is no energy loss of current converter between them, and the ocean battery has more efficient electricity. Vapour chamber (VC) and aluminium (AL) materials are assigned to be the LED PCBs. Results show that the effective thermal conductivity of the VCPCB is many times higher than that of the ALPCB, proving that it can effectively reduce the temperature of the LED and obtain more uniform luminance.

And the output voltage and LED lighting start unstable resulting from the air bubble of ocean battery slight vibration.

'Ni-Mg-La tri-metallic on alumina catalysts for steam reforming of a biomass gasification tar model compound', Duangduen Atong, Sildara Thassanaprichayanont and Viboon Sricharoenchaikul, introduces an alternative route to find a sustainable solution to tar formation problem during gasification process of biomass by converting these condensable by-products to energy rich gases. The novel synthesis of magnesium and lanthanum oxide-promoted nickel l/γ-alumina catalysts by co- and sequential impregnation methods was carried out and tested for their activities towards steam reforming of tar compound in a continuous fed quartz reactor at various operating conditions while evolved gas products were analysed real time using dedicated gas analyser. In depth analysis of catalysts, before and after reforming reactions were performed in order to suggest catalytic regenerability as well as their respective deactivation pathways. Promising results of high a performance catalyst were achieved that an appreciable quantity of value added fuel gas was obtained from tar conversion. In addition, the synthesised catalysts are relatively economical to produce which helps justify the feasibility of the biomass gasification process in the long run.

'A novel 2-DOF haptic master device using bi-directional magneto-rheological brakes: modelling and experimental investigation', by Phuong-Bac Nguyen, Jong-Seok Oh and Seung-Bok Choi, proposes a novel 2-DOF haptic master system featuring MR fluid for minimally invasive surgery (MIS). This system consists of two bi-directional magneto-rheological (BMR) brakes for rotational motion and torque generation. Unlike other conventional MR ones, BMR brakes work either a brake or clutch. Or in other words, it supplies not only resistant but repulsive torques depending on its working mode. Therefore, it possesses the possibility of compensating for the undesired residue friction which is inherent with other conventional MR brakes. Consequently, the proposed haptic system is expected to be able to sense in a wide range of environment from soft tissues to hard bones. Overall of the system is presented from modelling to control. In order to assess the effectiveness of the device, three experiments were carried out. The first experiment was conducted to assess the ability of compensating the residue friction of the BMR brake. Two other experiments explored the performance of the system in the hard and soft tissue environments.

In closing, we sincerely hope that you will enjoy reading this special issue.