Exfoliated clay/polyaniline nanocomposites through tandem diazonium cation exchange reactions	JLASSI khouloud <sup>(a,b)</sup> , CHEHIMI Mohamed <sup>(a)</sup> , Memia BENNA Zayani <sup>(b)</sup> (a) : Laboratoire ITODYS, UMR 7086, Université Paris 7, France (b) : LACRESNE, FSB/ISSTE Borj Cédria, Université de Carthage, Tunisie	Robust, conductive clay/polyaniline nanocomposites were prepared through a simple approach which consists of in situ polymerizing aniline, in the presence of the 4diphenylamine diazonium-modiffed bentonite. XPS measurements indicate that clay experiences a cation exchange of sodium by the diazonium, and the polyaniline is present in large amounts at the nanocomposite surface. As judged by XRD, the clay basal distance increased from 13.7 to 16.2 A after diazonium modi <sup>7</sup> freation, whilst, after the in situ polymerization of aniline, the clay characteristic peak at low angle (<8) has varished showing the ±xfoliation of the resulting nanocomposites. However, the nanocomposite prepared with unmodified clay was also found to be a polyaniline-rich surface but without any sign of exfoliation. In addition, the composite morphology, imaged by electron microscopy (SEM) and (TEM), differs significantly from that of pristine clay and shows twisted layers with an inter-distance which increases with the mass loading of the diazonium modification resulted in a quantum jump of the conductivity of the anocomposites compared to bentonite, ca. 6 orders of magnitude, whereas the deposition of PANI on pristine clay induced a marginal increase of conductivity from 109 to 2 108 S cml due to an uneven coating of the conjugated polymer.	
International Seminar on Novel Aspects in Material Science (ISNAMS 2015)	Research and PG Department of Chemistry MES KEVEEYAM COLLEGE VALANCHERY KERALA-INDIA	Fatigue damage applicable for fibre reinforced composites   Ho Sung Kim   Mechanical Engineering, School of Engineering,   Faculty of Engineering, School of Engineering,   Faculty of Engineering and Built Environment,   The University of Newcastle,   Callaghan, NSX 2308, Australia   email: <u>ho-sung kim@newcastle.edu.au</u> Fundamental aspects of S-Nfatigue damage applicable for fibre reinforced composites are covered. Historical milestones in research are discussed. Fundamental problems with development of fatigue damage and fatigue life predicions have been identified and critically discussed. A theory for mathematical framework consisting of axioms, relative conditions for compatibility, and boundary conditions, is developed for fatigue damage was conceptualized. Manifestation points for accumulated damage was conceptualized for boundary conditions by differentiating between damage accumulated before failure, and failure caused by damage. A selected equation for damage at failure as the reference damage was theoretically walidated for further validation of damage on S-N plane. Also, a damage function capable of predicting fatigue damage was theoretically validated for further validation of damage on S-N plane. Also, a damage function capable of predicting fatigue damage of S-N plane. Also, a damage function spectro of actions were made for two sequential blocks of fatigue block for further validation of care. A close agreement between the validated for further validation of zero. A close agreement between the validated for further validation of zero. A close agreement between the validation for comparisons between experimental results and theoretical fatigue block boreactions were made for two sequential blocks of fatigu	experimental results and the predictions was tound.

### **Novel Aspects in Material Science (ISNAMS 2015)**

An international seminar on "Novel Aspects in Material Science" was organised under the research and PG Department of Chemistry, MESKeVeeYam College, Valanchery on 11<sup>th</sup> March 2015. Prof. Ho-Sum Kim (University of New Castle, Australia) Ms.JlassyKhouloud (University Paris Dederot, France) was the resource persons in that seminar.



# International Symposium on Novel Aspects of Material Science (NAMS 2015)

### March 11, 2015 MES Keveeyam College Valanchery

#### Technical Session I "Fatigue Damages in Solids"

Dr Ho-Sung Kim Senior Lecturer School of Mechanical Engineering and Mechatronics University of NewCastle Australia

### Technical Session II

**"Clay Nano Composites"** Ms. Jlassi Khouloud ITODYS (Interfaces, Traitements, Organisation et DY namique des S ystèmes Laboratory) University Paris Diderot France

**Dr Ho-Sung Kim** 

### Senior Lecturer School of Mechanical Engineering and Mechatronics University of NewCastle Australia

Ho-Sung Kim's research covers a relatively wide range of research topics appeared in over 100 publications for the fields including complex assessment, fracture mechanics fatigue, and manufacturing and properties of composite materials. Ho-Sung has made, perhaps, one of most significant milestones in S-N fatigue damage history by developing a theoretical framework and deriving a theoretical S-N curve.

Ho-Sung is director of research and development of Aceboard building products Pty Ltd, has been nominated as expert of international standing by the Australian Research Council (ARC) College of Experts and thus has contributed to assessments on ARC research proposals. He has been invited several times to international conferences in recognition of major contributions in the area of research. His research has led one of his PhD students to be awarded a Faculty of Engineering and Environment Post graduate Research prize in Mechanical and Mechatronics Engineering in 2004. He has been regularly a session chairman in various international conferences. He has been invited IVW (Institute of Composite Materials), Kaiserslautern University of Technology, Germany, 2003 under auspices of DAAD (Deutscher Akademischer Auatauschdienst) German Academic Exchange Service fellowship. He has been also invited to review numerous submitted research papers for international conferences and PhD theses. He has been a member of various committees of international conferences

### Ms.Jlassi Khouloud

ITODYS (Interfaces, Traitements, Organisation et DY namique des S ystèmes Laboratory) University Paris Diderot France



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Date:05/03/2015

#### CIRCULAR

Research and PG Department of Chemistry, MES KeVeeYamValanchery, decide to organize a one day InternationalSeminar "Novel Aspects in Material Science" on 11.03.2015. All staffs and students are hereby notified to be present for the successful conducting of the function.

Head of the Department



M.E.S KEVEEYEM COLLEGE VALANCHERY, PIN- 676 552 MALAPPURAM