

3rd International Conference and Exhibition on Materials Science & Engineering

October 06-08, 2014 Hilton San Antonio Airport, USA

Damage sensing of nanocomposites for smart paste applications

Park Joung-Man

Gyeongsang National University, Korea

Damage sensing was one of the important methods for evaluation of micro-cracking in such as, airplane, vehicle, vessel and building. Damage sensing paste was made as paint type and optimum paste condition was evaluated using nanocomposites with shape and concentration of filler. Bisphenol A type epoxy was used as composites matrix. Curing agents were used as two types of hardener like normal adhesive type amino hardner and construction adhesive type amide hardener. Two kinds of nanofillers were used CNT and graphene nanopowder. Dispersion condition of nanoparticles in epoxy matrix was compared with CNT/epoxy and graphene/epoxy using electrical resistance measurement and FE-SEM. Damage sensing property was investigated using uni-directional tensile test to evaluate electrical resistance signal. Results of electrical resistance measurement were compared and correlated with those of tensile elongation and strength. Durability of composites paste was evaluated using dynamic fatigue test. Graphene nanopowder showed lower cohesive effect with each other than CNT. At last, nanocomposites paste for damage sensing was investigated in fiber reinforced composites for the prediction of micro-crack and delamination. Interfacial adhesion and interface condition were analyzed using electrical resistance measurement of nanocomposites under compression loading. Damage sensing property of normal adhesive was better than the constructional adhesive, whereas mechanical durability of construction adhesive type was better.

Biography

Park Joung-Man is Professor at Gyeongsang National University, Korea. He has completed his PhD from the Washington State University, 1991 and Postdoctoral from Cornell University, 1992. He published more than 130 papers in Interfacial properties of composite materials and NDE. He is currently Co-Editors-in-Chief of Advanced Composite Materials and Adjunct Professor at Department of Mechanical Engineering, University of Utah since 2004. He is Vice President of Korea Society of Composite Materials (KSCM).

jmpark@eng.utah.edu