PP-FM-246

Structural Investigation of Sm and Sn Doped $BaTiO_3$

B.Vigneshwaran[1], A.M.Kamalan Kirubakaran[1,2], P.Kuppusami[1,3]*, S.Ajith Kumar[3]

[1] *Centre for Nanoscience and Nanotechnology, International Research Centre, Sathyabama Institute of Science and Technology, Chennai – 600119.*

[1,2] *Centre for Functional and Surface-Functionalized Glasses (FUNGLASS), Trenčín University of Alexander Dubček in Trenčín, Študentská 2, 911 50 Trenčín, Slovak Republic.*

[1,3] *Centre of Excellence for Energy Research, International Research Centre, Sathyabama Institute of Science and Technology, Chennai – 600119.*

***Corresponding Author:** pkigcar@gmail.com

ABSTRACT

$(Ba_{0.9}Sm_{0.1})$ $(Sn_{0.05}Ti_{0.95})$ O_3 (BSSTO) ceramics were prepared by solid state reaction route and sintered at 1673 K. The BSSTO thin film was prepared by electron beam evaporation technique by using the sintered pellets. X-ray diffraction of the BSSTO investigated and confirmed the material has formed crystalline nature and also in single phase. Raman spectroscopy was used to study the morphology, structural and phase transition behaviour of BSSTO bulk as well as thin film. The Raman analysis indicated that the film formed at 973 K by electron beam evaporation is less crystalline than that of the bulk BSSTO.

Keywords: $BaTiO_3$, Structural properties, E-beam evaporation technique.

PP-FM-259

Enhancement of an environmentally friendly polymer rubber hybrid composite

M. Ruban[a], Sanjeevi baskar[b] and S. Thebesh[c]

[a]*Department of Automobile Engineering, Vels Institute of Science, Technology & Advanced Studies (VISTAS), Chennai, India.*

[b]*Department of Automobile Engineering, Vels Institute of Science Technology and Advanced Studies (VISTAS), Chennai, India.*

[c] *Student, Department of Automobile, Vels Institute of Science Technology and Advanced Studies (VISTAS), Chennai, India.*

ABSTRACT

Natural rubber's (NR) adaptability as an elastomer is crucial in the contemporary environment. It is crucial to reinforce elastomers with fillers that have many functions in order to enhance their distinctive features. In the current investigation, butadiene and styrene-butadiene by using a two-roll mixing hydraulic press under specific operating conditions, rubber-reinforced natural rubber hybrid composites were created. Additionally, filler loading in natural rubber (NR) was demonstrated for the creation of rubber composites. They were looked into in terms of morphological research and mechanical qualities. The findings

demonstrated that when WTR loading increased, tensile strength and elongation at break dropped. With WTR loading, the tensile modulus and hardness significantly increased.

Keywords: Ground Tyre Particles, Natural Rubber Composite Material, And Mechanical Qualities; Morphological Studies.

PP-FM-267

Investigation on testing and analysis of polypropylene fibre under tensile

Baskar S[a], Vinoth K[b] and P Sambandam[c]

[a]*Department of Automobile Engineering, Vels Institute of Science, Technology & Advanced Studies, Chennai, India.*
[b]*Student, Department of Automobile Engineering, Vels Institute of Science, Technology & Advanced Studies, Chennai, India*
.[c]*School of Mechanical and Construction, Vel Tech Rangarajan Dr.Sagunthala R&D Institute of Science and Technology, Chennai, India.*

ABSTRACT

An extensively used thermoplastic polymer is polypropylene (PP). Premature failure of polymers and polymer composites is caused by the development of cracks and microcracks during the course of their lifetime. A material failure caused by the development of cracks and microcracks could be disastrous. To ensure the performance reliability, cost-effectiveness, and safety of polymer constructions, cracks and microcracks must be found and effectively repaired. This article examines the most recent methods for detection and observation and focuses on the beginning and growth of cracks in polypropylene structures. Due to its weak fracture behaviour, its usage as an engineering thermoplastic is somewhat constrained. Among scientists, there is still disagreement over the failure mechanism. This is because polypropylene fractures are complicated. Through the use of three-point bending tests, the fracture mechanism of polypropylene has been investigated in this work. The outcome of a three-point bending test reveals the presence of a large damage zone in front of the notch. Due to the significant plastic zone that is present in the area around the fracture tip, the elastoplastic fracture mechanics technique will be used.

Keywords: Polypropylene, Cracks, Three-Point Bend, Elasto Plastic Fracture Mechanics.