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Abstract: In this study a facile sol-gel auto-combustion methodology has been used to synthesize nearly pure BiFeO3 (BFO) nanocrystals at relatively low temperature. An optimum synthesis condition has been established to obtain particles with spherical shape and uniform size distribution. Well crystallized BFO nanoparticles of average particle size 26 nm have been confirmed by X-ray diffraction analysis. Size and morphology of the synthesized materials are observed using Field emission scanning electron microscope (FESEM). Magnetic hysteresis loop measurement of BFO nanoparticles shows substantial improvement in saturation magnetization with a value of 6.5 emu/g compared to 0.1 emu/g for the bulk antiferromagnetic sample. The origin of the magnetic property can be attributed to the size confinement effect for the particles with size less than 62 nm, period of the spiral modulated spin structure.

Keywords: BiFeO3, ferromagnetism, nanoparticles, sol-gel auto-combustion.

References:
survey. Ten schools were selected and three hundred students were interviewed based on random sampling. Students were provided with close ended questionnaire and analysis was performed based on their feedback. Analyzed data show that various reasons contribute to traffic congestion near schools during peak period. Among these reasons, use of private car is one of the main reasons of congestion near the schools of Dhammond area. Significant portion of student thinks school buses are too crowded, school buses are not safe enough and bus do not arrive or leave in time. Car users can be attracted to the school buses by providing proper service and safety. Along with door-to-door peak up and least travel time; majority of student also suggested for air condition and GPS tracking in school bus. Most of the students have residence along some particular routes. If bus routes are introduced equipped with necessary facilities and services according to the demand of the students, then it will attract a large amount of students to use this service which will ultimately reduce congestion near the schools during peak period.

Keywords: congestion, questionnaire survey, School bus, traffic.

References:

Authors: Aravapalli Vanaja, Karumuri Srinivasa Rao

Paper Title: Sol-Gel Synthesis and Characterization of Pure and Silver Doped Zinc Oxide Nanoparticles

Abstract: ZnO is a fast maturing semiconductor with significant research effort invested in it over the past decade. The emerging novel optical and electronic properties of ZnO semiconductor nanoparticles have been a focusing issue among researchers due to the great prospective in optoelectronic applications including transparent thin-film transistors, photo detectors, light-emitting diodes and laser diodes that operate in the blue and ultraviolet region of the spectrum. To enhance the properties of ZnO, researchers concentrate on doping ZnO with transition metal ions (Al, Cu, Ni). In this paper, Influence of Ag doping on structure, morphology and optical properties were investigated. Pure and silver doped ZnO nanoparticles were synthesized by simple, inexpensive sol–gel process. The powders were investigated using X Ray Diffraction (XRD), Scanning electron Microscopy (SEM) and Fourier transform infrared (FTIR) Spectroscopic characterizations. XRD reveals hexagonal wurtzite structure of nanoparticles with high purity. The incorporation of Ag+ in the place of Zn2+ provoked an increase in the size of nanoparticles as compared to undoped or pure ZnO nanoparticles. SEM images showed that Ag doping has great influence on morphology of ZnO. The presence of functional groups analyzed using FTIR spectra. Ag doped ZnO nanoparticles in the present study have played a vital role in surface morphology, structural and optical properties of ZnO nanoparticles.

Keywords: FTIR, Nanoparticles, SEM, XRD, Zinc oxide

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Paper Title: A Fuzzy Two-Warehouse Inventory Model for Power Demand Pattern, Shortages with Partially Backlogged

Abstract: In this paper deals with fuzzy inventory model for non deteriorating item, power demand pattern, shortage under partially backlogged with two warehouse, is formulated and solved. After illustrate the model it test validity of the same, one numerical example have been solved then test sensitivity analyses. Fuzziness is applying by allowing the cost components (holding cost, shortage cost, etc). In fuzzy environment it considered all required parameter to be pentagonal fuzzy numbers. The purpose of the model is to minimize total cost function.

Keywords: Inventory, Two Ware-House, Power demand, Fuzzy number, Shortages, Pentagonal fuzzy number.

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Authors: Shoumya Nandy Shuvo, Kazi Md. Shorowordi, M. A. Islam

Paper Title: Effect of Nanoclay on Jute Fiber Reinforced Polyester Composites

Abstract: This research focus on the development of nano-structured composites and to investigate the effect of nanoclay on the mechanical and thermal properties of jute fiber reinforced polyester composite. 1wt.% nanoclay was reinforced in polyester with 5 vol.% jute fibre of size 5 mm. For comparison 5 vol.% jute fiber composite without nanoclay was also prepared. Tensile and flexural strength of the produced samples were measured by using an Instron Universal Testing Machine. Hardness of the developed nanocomposites was measured by a Shore A Hardness Tester. The fracture surfaces were investigated by Scanning Electron Microscope (SEM). Thermal properties were evaluated using Thermo-gravimetric Analysis (TGA). It is found that modulus and strength of nanoclay reinforced polyester nanocomposite is higher than that of pure polyester, jute fiber reinforced polyester composite and nanoclay reinforced jute fiber composites. However, thermal stabilities of nanoclay reinforced jute fiber composites are found to be higher than that of pure polyester, nanoclay reinforced nanocomposite and jute fiber reinforced composite. In fractographic analyses, it is found that pure polyester undergoes ductile fracture, nanoclay reinforced nanocomposite undergoes brittle fracture and jute reinforced composite undergoes mixed fracture.

Keywords: Nanocomposite, Nanoclay, Tensile property, Flexural strength, Fracture morphology.

References:

