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Growth and field emission properties of carbon nanotubes

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Carbon nanotubes (CNTs) are currently attractive materials for a diverse range of applications because of their unique properties and potential applications. On applying electric fields, nanotube emits electrons from its tips at a prodigious rate. The field emission (FE) properties of CNTs are governed by the work function, crystalline structure, geometry of their tips, etc. In addition, the surrounding gases and impurities on the surface have been known to strongly affect their FE characteristics. It has been verified in the previous studies that the structural defects on the surface of carbon-based materials could be a crucial factor to determine their FE characteristics. Different transition metal catalyst nanocrystalline films were deposited on silicon substrate using RF sputtering technique. The catalyst coated Si substrate was heated to achieve synthesis temperature at a rate of 15°C/min while continuously passing the H_2 gas which works as carrier gas. After stabilizing the synthesis temperature at 650°C, NH_3 gas was passed with flow rate 120 sccm for pretreatment which helps in nucleation of catalyst. Pretreatment reduces the size of catalyst particle up to nanometer level which provides nucleation site for formation of CNTs. A mixture of gases $H_2/C_2H_2/NH_3$ with flow rate 8:1:8 sccm respectively was used, where C_2H_2 work as a carbon source gas. Growth temperature was kept constant at 650°C. Scanning electron microscope and Raman study confirm that aligned and high density CNTs successfully grown on the Si substrate.

Biography

K. N. Tripathi completed his Ph.D. at the age of 25 years from The University of Delhi, India and postdoctoral studies from University of New Castle, UK. He has been a Professor in Department of Electronic Science and dean research, University of Delhi and also vice chancellor, Agra University. He has guided 21 students for their Ph.D. and published more than 75 research papers in international journals. Currently, he is the vice chancellor, K. R. Mangalam University, Gurgaon.

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Influence of Ti, B and Sr on the tribological properties of forged A356 alloy

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In the present paper, effect of forging on the wear behavior of forged A356 alloy with and without the addition of grain refiner and modifier has been investigated under dry sliding conditions using a pin-on-disc wear testing machine. Forging was carried on A356 alloy using a pneumatic power forging hammer of Model MS 412 for analyzing the wear properties. Wear experiments were carried out at various normal pressures, sliding speeds and sliding distances. The metallographic studies reveal that the forged samples have a more uniform distribution of the eutectic silicon in comparison to the as cast microstructures. The tribological results reveal that in forged condition, a considerable decrease in the weight loss and frictional force was noticed as compared to the as cast A356 alloy and this would be due to the effect of forged and heat treated A356 alloy. Abrasive, oxidative, adhesive wear mechanisms are operative in different wear conditions.

Biography

D. G. Mallapur has completed his Ph.D. at the age of 47 years from the Department of Metallurgical and Materials Engineering from National Institute of Technology Karnataka, Surathkal, Mangalore, Karnataka, India. He is an Associate Professor in the Department of Industrial and Production Engineering, Basaveshwar College of Engineering, Bagalkot, Karnataka, India (A Government - Aided Institution). He has published 7 papers in reputed journals and his research areas include grain refinement and modifications studies, mechanical and tribological properties studies of A356 alloy at room and high temperatures.

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