World Academy of Science, Engineering and Technology
International Journal of Materials and Metallurgical Engineering
Vol:9, No:07, 2015

Effect of the Poisson's Ratio on the Behavior of Epoxy Microbeam

Authors : Mohammad Tahmasebipour, Hosein Salarpour

Abstract : Researchers suggest that variations in Poisson's ratio affect the behavior of Timoshenko micro beam. Therefore, in this study, two epoxy Timoshenko micro beams with different dimensions were modeled using the finite element method considering all boundary conditions and initial conditions that govern the problem. The effect of Poisson's ratio on the resonant frequency, maximum deflection, and maximum rotation of the micro beams was examined. The analyses suggest that an increased Poisson's ratio reduces the maximum rotation and the maximum rotation and increases the resonant frequency. Results were consistent with those obtained using the couple stress, classical, and strain gradient elasticity theories.

Keywords : microbeam, microsensor, epoxy, poisson's ratio, dynamic behavior, static behavior, finite element method
Conference Title : ICESE 2015 : International Conference on Electromaterials Science and Engineering
Conference Location : Istanbul, Türkiye
Conference Dates : July 29-30, 2015