

عنوان مقاله:

Investigating Vibration Behavior of Single-Walled Carbon Nanotubes Using Finite Element Method

محل انتشار:

کنفرانس بین المللی فرآورش پلیمرها (سال: 1390)

تعداد صفحات اصل مقاله: 5

نویسندگان:

Abdolhossein Fereidoon - Assistant Professor, Department of Mechanical Engineering, Semnan branch, Islamic Azad University, Semnan, Iran

Kazem Reza Kashyzadeh - Young Researchers Club, Semnan branch, Islamic Azad University, Semnan, Iran

.Shokoofeh Dolati - Young Researchers Club, Semnan branch, Islamic Azad University, Semnan, Iran

Alireza Amiri Asfarjani - Engineering Department, Qom branch, Islamic Azad University, Qom, Iran

خلاصه مقاله:

In this article, vibration analysis of single-walled carbon nanotubes (SWCNTS) by using finite element method (FEM) is studied. The simulations are carried out for two types of zigzag carbon nanotubes (4, 0), (6, 0), armchair carbon nanotubes (4, 4) and (6, 6) with free-fixed and fixed-fixed end conditions. The vibrational behaviour of SWCNTS with different side ratio of lengths and dimensions is modeled by elastic beams and point masses. The beam element elastic properties are calculated by considering mechanical characteristics of the covalent bonds between the carbon atoms in the hexagonal lattice. The mass of each beam element is assumed as point masses at nodes coinciding with the carbon atoms. Results are presented as diagrams stating natural frequencies of single-walled carbon nanotubes with respect to aspect ratio. The results indicate that natural frequencies decrease as aspect ratio increases. So it is preferred to use nanotubes with lower aspect ratios for dynamic applications in order to prevent resonance and dynamic damage

کلمات کلیدی:

single-walled carbon nanotubes (SWCNTS), vibration analysis, Finit element method

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/134170>

