عنوان مقاله:

An investigation into the impression of geometrical parameters of multi-wall coiled carbon nanotubes' constructing components on theirmechanical deformation using molecular dynamics simulation

محل انتشار:

دومین همایش بین المللی علوم و فناوری نانو دانشگاه تهران (سال: 1400)

تعداد صفحات اصل مقاله: 10

نویسندگان:

Parmida Fareghi - *School of Mechanical Engineering College of engineering University of Tehran, P.O. Box ۱۱۱۵۵-۴۵۶۳, Tehran, Iran*

Taraneh Karbaschi - *School of Mechanical Engineering College of engineering University of Tehran, P.O. Box ۱۱۱۵۵-۴۵۶۳, Tehran, Iran*

Ali Sharifian - *School of Mechanical Engineering College of engineering University of Tehran, P.O. Box ۱۱۱۵۵-۴۵۶۳, Tehran, Iran*

Mostafa Baghani - *School of Mechanical Engineering College of engineering University of Tehran, P.O. Box ۱۱۱۵۵-۴۵۶۳, Tehran, Iran*

Majid Baniassadi - *University of Strasbourg, ICube/CNRS, ۲ Rue Boussingault, ۶۷۰۰ Strasbourg France*

خلاصه مقاله:

In nowadays society, as a result of ever increasing tendency to miniaturization of devices and attentively to striking features of carbon based nanostructures, coiled carbon nanotubes (CCNTs) and multiwall CCNTs have become an indispensable component of nanodevices and energy-absorbing materials. To the best of our knowledge, the deformation behavior of multilayer CCNTs have not been scrutinized before. Therefore, in current study, the influence of varying geometrical parameters or working temperature of constructing elements of multiwall CCNTs on their mechanical behavior have been examined closely. The results of stretching these nanotubes have demonstrated that the deformation procedure of a two-layer CCNT is majorly dependent on its outer structure, as an example, the pulling out force and stretchability of a double wall CCNT can be raised up to ۴۰ nN and ۳۵۰% respectively, depending on its outer structure. Additionally, some of these nanotubes, have undergone reversible compressive and tensile loading and unloading procedure and their response during thisprocedure have been analyzed. These results would enable scholars to design CCNT based mechanical and electrical nanodevices with more potent perception

کلمات کلیدی:

Molecular dynamics simulation, Mechanical Properties, Coiled carbon nanotubes (CCNT), Reversibility effect, Multiwall CCNTs.