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carbon nanotubes (cnts) are widely investigated for their promising applications in nanoelectronics and nanotechnology. however, due to the difficulties in functionalization and solubility in most solvents, the use of cnts in composites often involves trial-and-error approach for their successful design, especially in the fabrication of cnt-based nanocomposites with interesting properties. in this study, a systematic approach is used to investigate the dependence of the mechanical and rheological properties of cnt/polymer nanocomposites on the variation of the electronic and morphological characteristics of the components. the influences of the polymeric additive and the assembling (formation, mixing or impregnation) processes on the composite performance are investigated, which provide detailed information for the pre-selection of the proper processing parameters for subsequent preparation of desired nanocomposites. over the past decades, various metallo-supramolecular dyestuffs with unique electronic, optical and magnetic properties have been constructed. the majority of these dyes are based on triangular m3l2 (m=cu or ag; l=thiolates, s, se, or te) hosts which self-assemble into aggregates with a geometry well-defined by the peripheral substituents. in this perspective, the design of functional molecules and materials based on ags3 is briefly reviewed. this work provides a guideline for the construction of novel supramolecular materials. in sports, cervical spine injuries are critical due to the severity of the damages and dramatic long term consequences (carll, park, &tortolani, 2010). post injury retrospective studies have been conducted with a global approximate evaluation of the cervical spine load (bogduk &yoganandan, 2001). also, direct measurement techniques are appearing using implanted telemetric devices (rohlmann, zander, graichen, dreischarf, &bergmann, 2011), however they have not yet been used for the cervical spine. consequently, the only way to estimate the internal load of the cervical spine remains through numerical modeling (cusick &yoganandan, 2002).classically numerical modeling is used in quasi static situations based on in vitro results using deformable body mechanics and finite element modeling (tropiano, et al., 2004). this approach is widely used to test or improve internal medical devices designed for the stabilization..

in this paper i will discuss how packaging layers may affect the mechanical behavior of emulsion-based active films. the influence of the specific interaction between hard-soft films, which controls the physical structure, is studied using novel experimental tools. porous thin films of polyester with varied hard-soft character have been made by a combination of dewetting and coagulation in a two-phase aqueous solution. the relationship between the physical structure of the coating and the mechanical behavior of the coating is studied using a novel x-ray diffraction based technique. it is shown that the dewetting of the coating forms open porous film structures, which determine the physical structure of the coating. the mechanical behavior of the coating is found to increase from hard (small pores and low water content) to soft (large pores and high water content) coatings, which suggest the physical origin of the mechanical behavior of soft-coated films and their potential. finally, their mechanical response behavior and the related mechanism are discussed. the present work has been undertaken to explore the changes in electronic properties of si nanoparticles when coupled with a 2d sheet of graphene. the density of states of the system as well as the energy band alignment is analyzed through density functional theory calculations. the calculated data shows that the electronic properties of the system are strongly dependent on the graphene layer, and an energy band offset is observed between the graphene sheet and the si-n clusters. the results demonstrated the possibility of opening a band gap in si nanoparticle systems by using 2d graphene sheets. a larger band gap of up to 2.2 ev is obtained for a graphene monolayer with a si-n cluster of 10 nm diameter compared to graphene multilayer systems with a si-n cluster of 2 nm diameter. 5ec8ef588b