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Structural Nanocomposites Applications 2.1 Introduction; 2.2 Case Study on Polyurethane/Organically-Modified Montmorillonite (PU/OMMT) Nanofoam Nanoparticles in Water Suspension; 2.3 Methodology; 2.3.1 Material Synthesis of Nanophased Composites; 2.3.2 Drop-Weight Impact Test and Fracture Particle Extraction; 2.3.3 Characterization; 2.3.3.1 Scanning Electron Microscopy (SEM); 2.3.3.2 Transmission Electron Microscopy (TEM); 2.3.3.3 X-ray Diffraction; 2.3.3.4 Dynamic Light Scattering (DLS); 2.4 Results and Discussion 2.4.1 Synthesized Nanocomposites 2.4.2 Generated Nanocomposite Dust from Impact Test; 2.4.2.1 Morphology Studies; 2.4.2.2 Size Effect; 2.5 Conclusion; Acknowledgement; References; Part 2: Remediation; 3 Prospects for Immobilization of Microbial Sorbents on Carbon Nanotubes for Biosorption: Bioremediation of Heavy Metals Polluted Water; 3.1 Dispersion of Metal Pollutants in Water Sources; 3.2 Removal of Metal by Conventional Methods; 3.3 Microbial Sorbents for Removal of Toxic Heavy Metals from Water; 3.3.1 Biouptake of Metal; 3.3.2 Factors Affecting Microbial Adsorption Capacity 3.3.2.1 Cell Age 3.3.2.2 Physicochemical Effect; 3.3.2.3 Cell Biomass; 3.3.2.4 Initial Concentration of Metal; 3.3.2.5 Metals Competition; 3.3.2.6 Exposure Time; 3.3.3 Isothermic and Kinetic Equilibrium of Biosorption; 3.3.4 Drawbacks Due to Inhibition; 3.3.5 Metal Tolerance Mechanisms of Microbial Sorbents; 3.3.6 Pretreatment of Microbial Sorbent; 3.4 Immobilization of Microbial Sorbents on CNTs; 3.4.1 Possible Interaction between Microorganisms and CNTs; 3.4.1.1 Microbial Cell Membranes and Functional Groups; 3.4.1.2 Characteristics of CNTs 3.4.2 Adsorption of Microorganisms on CNTs for Bioremediation

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Sommario/riassunto

At the nano size materials often take on unique and sometimes unexpected properties which results in materials being 'tuned' to build faster, lighter, stronger and more efficient devices and systems, as well as new classes of materials. In the water research, nanotechnology is applied to develop more cost-effective and high-performance water treatment systems as well as instant and continuous ways to monitor water quality as well. Nanotechnology in water applications potentially impacts on treatment, remediation, sensing, and pollution prevention. Nanotechnology for water treatment an

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