

عنوان مقاله:

A Review of Electrospun Nanofibers: Unraveling the Potential of Natural and Synthetic Polymers, Inorganic Materials and Advanced Nanofibers

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خلاصه مقاله:

An important tool in materials science and engineering is electrospinning, a flexible and scalable technique for creating nanofibers. By utilizing an electric field on a polymer melt or solution, ultrafine nanofibers with diameters ranging from tens to hundreds of nanometers are precisely deposited. These nanofibers exhibit exceptional surface area-to-volume ratios, resulting in distinct physical and chemical characteristics. The adaptability of electrospinning allows for the customization of fiber properties, such as diameter, morphology, and porosity, making it an indispensable tool for creating advanced materials with applications in biomedicine, and various other fields. Natural polymers can be chemically or physically modified to create new materials, and emerging nanotechnology systems enable the preparation of various functional materials. Cellulose nanocrystals, for instance, have gained attention for their superior performance and potential applications in materials and personal health sectors. Inorganic materials, composed of inorganic substances alone or in combination, have secured a significant position in the realm of materials as key industrial fiber materials. Electrospinning technology facilitates the production of inorganic fibers, such as metal, metal oxide, metal sulfide, carbon, and nitride fibers. While the fabrication of inorganic nanofibers is more intricate than polymer nanofibers in terms of process design and material selection, it presents new avenues for technological advancements and high-tech industry requirements.

کلمات کلیدی:

electrospinning, nanofibers, polymers, nanomaterials

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