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The properties and applications of helical carbon fibers and related materials: A review

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ABSTRACT

Helical carbon fibers (HCFs), a novel carbon nanomaterial, have fascinating 3D-helical/spiral morphology in combination with excellent properties. HCFs and related materials have been the object of intense fundamental scientific research and practical applications in past few years. HCFs have internal structures that are either hollow or solid, and have a remarkable range of morphologies depending on their fiber diameter, coil diameter and coil pitch. Catalytic thermal chemical vapor deposition has become a straightforward and convenient route to synthesize HCFs of various morphologies. The unique helical structure and excellent properties of HCFs make them potential candidates in numerous nanotechnology applications. The motivation of this article is to present an overview on the exciting properties and potential applications of HCFs and related materials as reported in the literature. At the end, the possible challenges, future prospects and brief summary for HCFs and related materials are highlighted.

Keywords: Helical carbon fibers and related materials; Synthesis; Properties; Applications

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Abbreviations

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