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| **Title:** | Recent advancements in nanocarbon derivatives From synthesis to applications. | | |
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| **Published Journal Name:** | Reference Module in Materials Science and Materials Engineering | | |
| **Type of Publication:** | Book Chapter | | |
| **Volume:** |  | Issue |  |
| **Publisher:** | ScienceDirect | | |
| **Publication Date:** | Mar 27, 2024 | | |
| **ISSN:** | 978-0-12-803581-8 | | |
| **DOI:** | https://doi.org/10.1016/B978-0-323-96020-5.00277-6 | | |
| **URL:** | https://www.sciencedirect.com/science/article/abs/pii/B9780323960205002776?via%3Dihub | | |
| **Other Related Info.:** | Page 1-29 | | |
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| **Abstract:** |  |
| Nanocarbons have been a focus of forefront research for decades. A number of nanocarbon derivatives have been examined and applied in numerous applications, from energy storage, sensors, and catalysts to medicines. Research on nanocarbon materials not only includes finding out various synthesis techniques but also understanding structural configurations, determining appealing mechanical, chemical, optical, and electrical properties, and implementing them in a wide variety of applications. Numerous review articles have been published depicting novel advances and special features of different nanocarbon species. Nonetheless, these articles mostly explain a particular derivative of nanocarbon. Studies encompassing all the derivatives in one platform, giving a complete picture ofthe overall advancements, are limited. Such reviews, however, are imperative for the comprehensive realization ofthe overall progress ofdifferent nanocarbon species, figuring out possible correlations, and making a comparative study among them. This study presents a comprehensive study on the synthesis, characterization, and applications of essential nanocarbon derivatives, which include carbon nanotubes, carbon nanofibers, carbon nanohorn, carbon nanoonions, carbon quantum dots, fullerenes, metallofullerenes, and graphene | |