

Recent development on carbon based heterostructures for their applications in energy and environment: A review

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ABSTRACT:

Nanostructured carbon based materials with unique and tunable properties make them to be utilized for various applications in different forms especially for energy and environmental applications. Carbon is a distinctive chemical element which has superior properties such as porous structure, low cost, resistance to basic and acidic conditions, easy accessibility, low density, good recycling properties, more abundant and ability to combine with other chemical elements in different ways. In this review, we have critically assessed the recent developments in carbon based heterostructures for their applications in energy and environment. Special consideration has been paid on the applications in dye-sensitized solar cells, hydrogen evolution reaction, oxygen evolution reaction, Li-ion battery, supercapacitor, photocatalysis for the degradation of organic pollutants, electrochemical/bio sensors and biomedical applications. Finally, the challenges and future developments of carbon based heterostructures for applications in energy and environment are also outlined.