Food waste derived tri-doped carbon as Pt-free counter electrode in dye-sensitized solar cells

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Costly Pt counter electrode is one of the obstacles for rapid commercialization of dye-sensitized solar cells. In this research, tri-doped carbon was prepared via solvothermal synthesis. Nickel metal was presented in different concentrations and food waste was used as a precursor for carbon with ethylenediamine and sulfur powder as additives. This newly prepared counter electrode shows a competitive performance with the Pt electrode. This work demonstrates the natural derived carbon could be a substrate for a cost-effective approach to prepare multi-functional materials for photovoltaic applications.

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Carbon Nanotubes and its commercial application

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The present production amount of carbon nanotubes (CNTs) for commercial purpose gradually goes up with increasing its application. Worldwide commercial interest in carbon nanotubes (CNTs) is reflecting in a production capacity, that presently exceeds several thousand tons per year. Ranging from rechargeable batteries, automotive parts, and sporting goods to boat hulls and water filters bulk CNT powders are incorporated in diverse commercial products. Advances in CNT synthesis, purification, and chemical modification are enabling integration of CNTs in thin-film electronics and large-area coatings. Although not yet providing compelling mechanical strength or electrical or thermal conductivities for many applications, CNT yarns and sheets already have promising performance for applications including supercapacitors, actuators, and lightweight electromagnetic shields.