عنوان مقاله:

Increasing the hydrogen storage capacity of single-walled carbon nanotube (SWNT) through facile impregnation by TiO۲, ZrO۲ and ZnO nanocatalysts

محل انتشار:

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خلاصه مقاله:

Various nanocomposites of TiO۲, ZnO and ZrO۲ decorated single wall Carbon nanotubes (SWNTs) were fabricated by facile and template free continuous ultrasonication/stirring of virgin metal oxide nanopowders and SWNTs in ethanol under UV-light illumination. The TEM micrographs showed that nanoparticles (NPs) were uniformly dispersed and bonded on the surface of SWNTs. The results of XRD as well as FTIR spectroscopy revealed coexistence of the precursors in each nanocomposite. The Hydrogen storage capacity of the nanocomposites was evaluated by a purpose-built sievert-type apparatus in kinetic mode measurement. The reversible values of hydrogen storage of the virgin single walled carbon nanotube (SWNT) and also the nanocomposites TiO۲, ZrO۲ and ZnO decorated SWNTs at room temperature was acquired ۰.۰۸, ۰.۴, ۰.۳۱ and ۰.۲۵ wt.%, respectively. The elevated absorption ability in nanocomposites is explained by catalytically effect of metal oxides in dissociation and compression of hydrogen into .(the absorbent sites of carbon nanotube (CNT

کلمات کلیدی:

Carbon Nanotube, Hydrogen storage, Spill Over, Metal oxide catalyst