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Preparation of Cu2ZnSnS4/N-MWCNTs as potential Pt free counter electrodes in dye sensitized solar cells

Cu2ZnSnS4(CZTS) is a quarternary chalcogenide composed of earth abundant and low toxicity elements. It has been reported to exhibit excellent catalytic activity, thus can be employed in dye sensitized solar cell (DSSC) counter electrodes for reduction of electrolytes to replace platinum. However, Cu2ZnSnS4 has low surface area and poor electron conductivity, which can be counter-acted by reinforcing it with nitrogen doped multi-walled carbon nanotubes(N-MWCNTs). N-MWCNTs show high electron transport properties due to incorporation of nitrogen atoms which creates structural defects in the carbon network.The interaction between CZTS and N-MWCNTs was evaluated by Raman spectroscopy and transmission electron microscopy characterization techniques. A hybrid system of the two compounds shows promising reduction capabilities of the DSSC electrolyte as evaluated by cyclic voltammetry.

Apply to be
 considered for a student
   award (Yes / No)?

Yes

Level for award
 (Hons, MSc,
   PhD, N/A)?

MSc

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