Graphene like carbon as photo-anode for the application of DSSCs

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The graphene-like carbon (GLC) thin films were deposited on fluorine doped tin oxide (FTO) glass substrates by hot filament chemical vapor deposition (HFCVD) with non-catalyst. The GLC substrates presented good transparency with low sheet resistance. The thickness and transparency of GLC substrates were easily controlled by varying the deposition time from 5-30 min at the constant filament temperature 1400◦C. The Raman studies confirm graphene like carbon nature due to the appearance of significant G and 2D peaks. The prepared GLC thin film substrates were directly used as conducting substrates to make TiO2 photo-anode for the fabrication of dye sensitized solar cells (DSSCs). A high solar-to-electrical conversion efficiency of ~6.94% is obtained by the DSSC fabricated with GLC substrate deposited for 10 min, which is higher than DSSC fabricated with bare FTO substrate.