Formation of oxide-free Sb_2S_3 by spin and heat-treatment of $Sb(III)(thioacetamide)_2Cl_3$

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Although Sb_2S_3 sensitizer is known to a promising candidate of replacing conventional Ru/organic dyes, the power conversion efficiencies of Sb_2S_3-sensitized solar cells have been slowly improving. This might be associated with the fact that the Sb_2S_3 thin-films are formed in aqueous phase based chemical bath deposition (CBD) which cannot avoid the formation of antimony oxides and requires tricky control of reactions for the formation of controlled thickness. Here, we developed a spin-coating and heat-treatment process to form pure Sb_2S_3 thin-films with controllable thickness by thermal decomposition of $Sb(TA)_2Cl_3$ precursor. Through the spin-coating and heat-treatment process, we could fabricate oxide-free Sb_2S_3 planar type sensitized solar cells.