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Nota di contenuto	Research progress of one-dimensional chalcogenide hetero-nanostructures -- Seed-mediated growth of binary sulfide hetero-nanostructures -- Steering the charge flow in ternary semiconductor-(semiconductor/metal) hetero-nanorods by unique architecture design -- Post-synthetic processing technology based on novel multi-node sheath hetero-nanorods for performance enhancement -- Integration of semiconducting sulfides for full-spectrum solar energy absorption and efficient charge separation.
Sommario/riassunto	This thesis focuses on the design and synthesis of novel one-

dimensional colloidal chalcogenide hetero-nanostructures for enhancing solar energy conversion applications. Semiconducting nanomaterials are particular attractive for energy conversion due to the quantum confinement effects dictating their unique optical and electronic properties. Steering the photo-induced charge-flow based on unique bandgap alignment in semiconductor heterojunctions is critical for photo-electric/chemical conversion. The author presents the controllable preparation strategies to synthesize 1D chalcogenide hetero-nanostructures with various fine structures, further been used as excellent template materials for preparing other novel and complex hybrid architectures through a series of chemical transformations. The heterogeneous growth mechanisms of novel hetero-nanostructures is studied for developing a facile and general method to prepare more novel heterostructures. The band gap structure simulations, detailed charge carrier behaviour and unique solar energy conversion properties of the prepared hybrid nanostructures are deeply investigated. This work would open a new door to rationally designing hybrid systems for photo-induced applications.