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Sommario/riassunto

This thesis focuses on chalcogenide compound quantum dots with special crystal structures and behaviors in an effort to achieve the synergistic optimization of electrical and thermal transport for high-efficiency thermoelectric materials. The controllability and large-scale synthesis of chalcogenide quantum dots are realized through simple colloid synthesis, and the synergistic optimization of the materials' electrical and thermal transport properties is successfully achieved. Furthermore, the book explores the mechanism involved in the integration of high thermoelectric performance and reversible p-n semiconducting switching in bimetal chalcogenide semiconductors. As such, the thesis will be of interest to university researchers and graduate students in the materials science, chemistry and physics.