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Hongfei Liu

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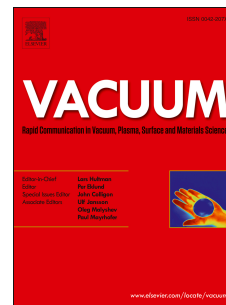
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A Short Review on Thermal Vapor Sulfurization of Semiconductor Thin Films for Optoelectronic Applications

Hongfei Liu^{a)}

*Institute of Materials Research and Engineering (IMRE), A*STAR (Agency for Science, Technology and Research), 2 Fusionopolis Way, Singapore 138634, Singapore*

Abstract

Band-gap and electrical engineering of semiconductor thin films as well as their heterostructural integrations are of increasing interest in optoelectronics for photodiodes and energy harvesting. In this short review, we have presented and discussed how semiconductor thin film materials are processed under vaporized sulfur environment at elevated temperatures, i.e., thermal vapor sulfurization (TVS), for advanced optoelectronic applications. Examples of the uses of TVS over a wide range of materials and length scales are also discussed. We conclude that this relatively simple and low-cost processing method, i.e., TVS, although has some remaining issues for practical industrial applications, can have important consequences in feasible explorations of novel optoelectronic materials.

Keywords: Thermal vapor sulfurization; semiconductor thin films; optoelectronics, 2D materials

^{a)} Author to whom correspondence should be addressed; electronic mail: liuhf@imre.a-star.edu.sg

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