



Liquid Solution Phase Epitaxial Growth of Al-doped f-SiC for LEDs

Tang, Kai; Ma, Xiang; van der Eijk, Casper ; Ou, Haiyan

Publication date:
2018

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):

Tang, K., Ma, X., van der Eijk, C., & Ou, H. (2018). Liquid Solution Phase Epitaxial Growth of Al-doped f-SiC for LEDs. Paper presented at E-MRS Spring Meeting 2017, Stasbourg, France.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Liquid Solution Phase Epitaxial Growth of Al-doped f-SiC for LEDs

Authors : Kai Tang, Xiang Ma, Casper van der Eijk, Haiyan Ou²

Affiliations : SINTEF Materials and Chemistry, Trondheim, Norway;

²Department of Photonics Engineering, Technical University of Denmark, Denmark

Resume : This paper presents our laboratory results of growing a new type of compound semiconductor crystal, i.e. fluorescent silicon carbide (f-SiC), by using liquid solution phase epitaxial (LPE) technology. This new type of f-SiC based white LEDs (WLEDs) represents higher luminous efficiency, better light quality and longer lifespan, compared to the current yellow phosphor based white LEDs. Liquid phase epitaxy technology is able to yield a high crystalline quality in terms of structural perfection owing to the fact that it is a near equilibrium process. In addition, the technological equipment required for LPE is relatively inexpensive. The fundamental backgrounds for LPE growth of Al-doped 4H-SiC are first introduced and elaborated by new thermodynamic and crystal growth models. Based on theoretical analyses, the new designed experimental apparatus is then constructed. The experimental results are presented and discussed. Since operational temperature of LPE growth is much lower than that currently used in physical vapour transport (PVT) process, it is expected to save the energy consumption for SiC crystal growth.