



## Liquid Phase Epitaxial Growth of Al-doped f-SiC for White Light-Emitting Diodes

Tang, Kai; Ma, Xiang; can der Eijk, Casper ; Ou, Haiyan; Wei, Yi

*Publication date:*  
2017

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

[Link back to DTU Orbit](#)

*Citation (APA):*

Tang, K., Ma, X., can der Eijk, C., Ou, H., & Wei, Y. (2017). *Liquid Phase Epitaxial Growth of Al-doped f-SiC for White Light-Emitting Diodes*. Abstract from 5th international workshop on LED and Solar Applications, Kgs. Lyngby, Denmark.

---

### 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 Phase Epitaxial Growth of Al-doped f-SiC for White Light-Emitting Diodes

Kai Tang<sup>1,\*</sup>, Xiang Ma<sup>1</sup>, Casper van der Eijk<sup>1</sup>, Haiyan Ou<sup>2</sup> and Yi Wei<sup>2</sup>

<sup>1</sup>SINTEF Materials and Chemistry, 7465 Trondheim, Norway

<sup>2</sup>Department of Photonics Engineering, Technical University of Denmark, DK-2800, Kgs. Lyngby, Denmark

\*E-mail: Kai.Tang@sintef.no

**Keywords—** *fluorescent silicon carbide, LPE growth, Al-doped, equilibrium analysis, growth rate*

The present paper focuses on our recent experimental results of growing a new type of compound semiconductor crystal, i.e. fluorescent silicon carbide (f-SiC), using the 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 can yield a high crystalline quality in terms of structural perfection owing to the fact that it is a near equilibrium crystalline growth process. In addition, the technological equipment required for LPE is relatively inexpensive. The fundamental backgrounds for LPE growth of Al-doped 6H-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.