

# Polarity Structure of Oxide and Nitride Films

Keywords: III-V nitride, ZnO

Masatomo Sumiya

Electric and Electronic Materials Field / Wide Bandgap Semiconductors Group

SUMIYA.Masatomo@nims.go.jp | [https://samurai.nims.go.jp/profiles/sumiya\\_masatomo?locale=en](https://samurai.nims.go.jp/profiles/sumiya_masatomo?locale=en)



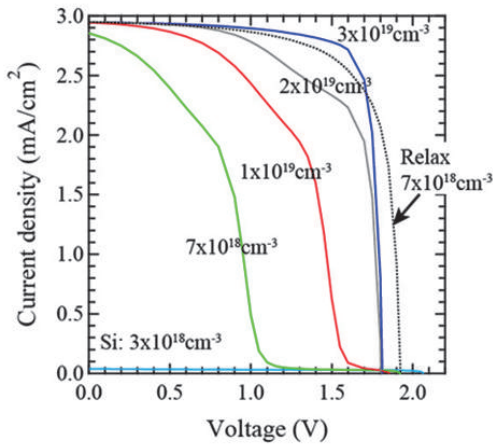
## Background

Oxide- and III-V nitride thin films have been grown by metalorganic chemical vapor deposition. The defects are evaluated to improve the quality of film, and to develop the devices which can work in the higher temperature.

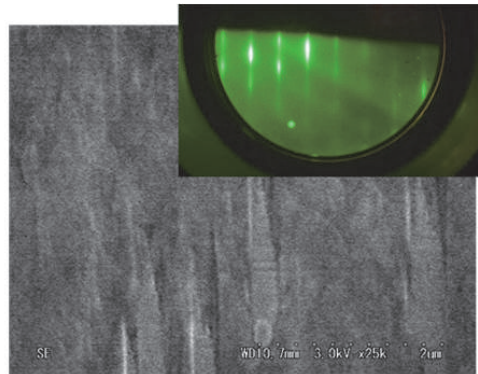
## Aim

- Evaluation of defect levels in InGaN and development of photovoltaic device.
- Non-polar ZnO film by MOCVD and control the valence band.

## Advanced Research Topics



Simulated I-V characteristics of +c p-GaN / strained InGaN / n-GaN with various Si doping density.



Non-polar m-plane ZnO film by metalorganic chemical vapor deposition using H<sub>2</sub> ambient.

## Publications

- The next generation materials for photovoltaic device of III-V nitride and ZnO; Material Stage 12, 46-49 (2012).

## Summary

- Evaluation of defect levels in InGaN film
- Photovoltaic device of III-V nitrides
- Non-polar ZnO film by MOCVD
- Patents: 5

## Research outcome

- High power and high frequency device
- High performance LED
- Wavelength conversion device