Faculty of Engineering
Tokushima University

A Research of InGaAlN and AlC LEDs

Professor Shiro Sakai

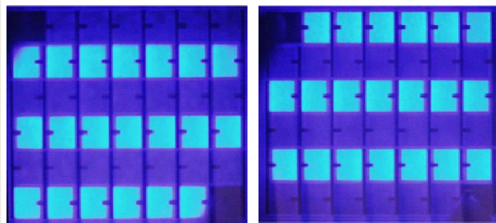


Fig.1

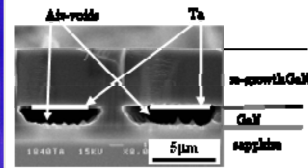
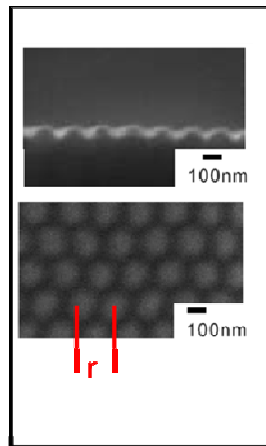


Fig.2



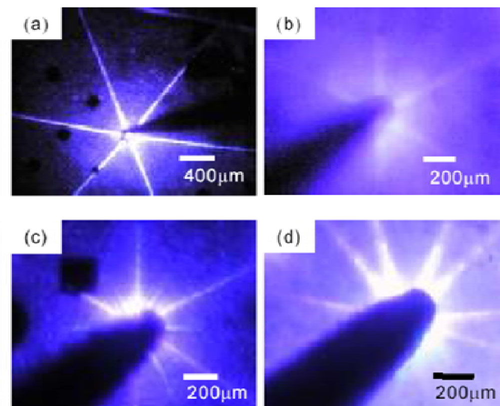


Fig.3

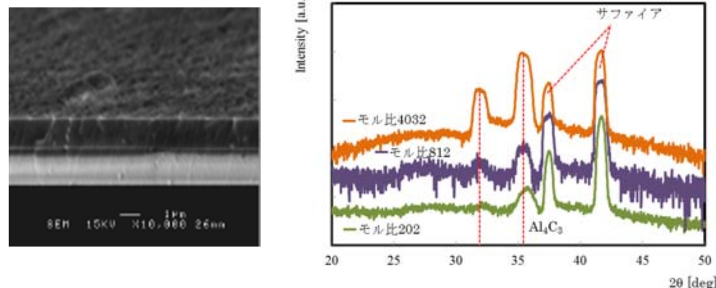


Fig.4

InGaAlN and AlC LEDs are researched.

A high voltage LED is developed. (Fig.1)

Ta-GaN is etched to sapphire during growth, and GaN, the epitaxial layer, is peeled off on Si, for example. (Fig.2)

Nano-pattern is formed on GaN, and their far field pattern are viewed as shown in Fig.3 (a) r=200 nm, (b) r=300 nm, (c) r=400 nm and (d) r=500 nm. It is clear that the 6th fold pattern is clearly visible for 200 nm which is 6 times for the emitting light.

P-type Mg-Ga1-xAlxN for x>0.3 is affected by the too deep level of Mg from the valence band, and it becomes an insulator, while C-doped AlGaN is possible candidate for p-type conduction. We are making an effort to make carbon-doped AlGaN or AlN a p-type conduction.

We are growing AlC on sapphire, SiC and Si. SEM and X-ray rocking curve are shown in Fig.4, where a substrate is sapphire.

Keywords：MOCVD, LED, AlGaInN, AlC
E-mail: sakai@ee.tokushima-u.ac.jp
Tel.: +81-88-656-7446
Fax: +81-88-656-7446