



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA



Nelson Mandela  
Metropolitan  
University  
for tomorrow

UNIVERSITY OF THE  
FREE STATE  
UNIVERSITEIT VAN DIE  
VRYSSTAAT  
YUNIBESITHI YA  
FREISATA



UFS·UV  
NATURAL AND  
AGRICULTURAL SCIENCES  
NATUUR- EN  
LANDBOUWETENSAPPE

Contribution ID: 59

Type: **Poster Presentations**

## Chemical and electrical characteristics of annealed Ni/Ir/Au and Ni/Au contacts on AlGaN

Wednesday, 6 May 2015 13:30 (1h 30m)

Aluminum gallium nitride ( $\text{Al}_x\text{Ga}_{1-x}\text{N}$ ) is a ternary wide direct bandgap semiconductor. The Al to Ga ratio can be varied to achieve various bandgap ranging from 3.4 eV for pure GaN to 6.2 eV for pure AlN. This property makes AlGaN based devices suitable for light emitting and light detecting devices such as LED's and photodiodes. In fabricating a device such as a Schottky diode the metals deposited on the semiconductor play an important role in the operation of the device. This is because the metal-semiconductor contact of a Schottky diode influences the transport mechanisms of the device. It therefore becomes significant to understand the interaction of metals with the semiconductor substrate. Annealing has been used as a method of studying the evolution of the optical and electrical properties of semiconductor based devices [1,2]. In particular a study was performed on AlGaN Ni (20 Å)/ Au (50 Å) and Ni (20 Å)/ Ir (30 Å)/ Au (50 Å) Schottky photodiodes [3]. The samples were subjected to isochronous annealing for 5 min. under an Ar. ambient. The evolution of the chemical properties of these contacts with temperature is studied by using two surface characterization methods namely Time of Flight Secondary Ion Mass Spectroscopy (TOF-SIMS) and X-ray photo electron spectroscopy (XPS).

**Are you currently a postgraduate student? (Yes/No)**

Yes

**At what level of studies are you currently? (Hons/MSc/PhD)**

PhD

**Please provide the name and email address of your supervisor.**

Prof. WE Meyer; wmeyer@up.ac.za

**Primary author:** Mr NGOEPE, Phuti (University of Pretoria)

**Co-authors:** Prof. AURET, Danie (University of Pretoria); Dr COETSEE, Elizabeth (University of the Free State); Mr OMOTOSO, Ezekiel (University of Pretoria, Pretoria, South Africa); Prof. SWART, Hendrik (University of the Free State); Ms DUVENHAGE, Mart-Mari (University of the Free State); Dr DIALE, Mmantsae (University of Pretoria); Prof. MEYER, Walter (University of Pretoria)

**Presenter:** Mr NGOEPE, Phuti (University of Pretoria)

**Session Classification:** Poster

**Track Classification:** SACPM