



US008574940B2

(12) **United States Patent**  
**Lin et al.**

(10) **Patent No.:** **US 8,574,940 B2**

(45) **Date of Patent:** **Nov. 5, 2013**

(54) **METHOD OF MAKING A FLEXIBLE OPTOELECTRONIC DEVICE HAVING INVERTED ELECTRODE STRUCTURE**

(58) **Field of Classification Search**  
USPC ..... 257/40, 43, 53, E51.028; 438/99, 22  
See application file for complete search history.

(71) Applicant: **National Taiwan University**, Taipei (TW)

(56) **References Cited**

(72) Inventors: **Ching-Fuh Lin**, Taipei (TW); **Kao-Hua Tsai**, Taipei (TW)

U.S. PATENT DOCUMENTS

(73) Assignee: **National Taiwan University**, Taipei (TW)

7,719,001 B2 \* 5/2010 Nomura et al. .... 257/40  
2008/0006820 A1 \* 1/2008 Schols et al. .... 257/40  
2008/0142079 A1 \* 6/2008 Ting et al. .... 136/263

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

FOREIGN PATENT DOCUMENTS

EP 1919008 A2 5/2008  
TW M330563 4/2008

\* cited by examiner

(21) Appl. No.: **13/743,930**

*Primary Examiner* — Zandra Smith

(22) Filed: **Jan. 17, 2013**

*Assistant Examiner* — Paul E. Patton

(65) **Prior Publication Data**

US 2013/0130423 A1 May 23, 2013

(74) *Attorney, Agent, or Firm* — Stout, Uxa, Buyan & Mullins, LLP

**Related U.S. Application Data**

(62) Division of application No. 12/612,670, filed on Nov. 4, 2009, now Pat. No. 8,378,337.

(57) **ABSTRACT**

(30) **Foreign Application Priority Data**

Aug. 11, 2009 (TW) ..... 98126975 A

A flexible optoelectronic device having inverted electrode structure is disclosed. The flexible optoelectronic device having inverted electrode structure includes a flexible plastic substrate having a cathode structure, an n-type oxide semiconductor layer, an organic layer, and an anode. The n-type oxide semiconductor layer is disposed on the cathode structure. The organic layer is disposed on the n-type oxide semiconductor layer. The anode is electrically connected with the organic layer.

(51) **Int. Cl.**  
**H01L 51/00** (2006.01)

(52) **U.S. Cl.**  
USPC ..... 438/46

**15 Claims, 13 Drawing Sheets**

