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Marks et al.

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(45) **Date of Patent:** ***Mar. 12, 2013**

(54) **INORGANIC-ORGANIC HYBRID THIN-FILM TRANSISTORS USING INORGANIC SEMICONDUCTING FILMS**

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(22) Filed: **Jan. 16, 2012**

(65) **Prior Publication Data**

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Related U.S. Application Data

(63) Continuation of application No. 11/642,217, filed on Dec. 20, 2006, now Pat. No. 8,097,877.

(60) Provisional application No. 60/752,159, filed on Dec. 20, 2005.

(51) **Int. Cl.**

H01L 29/10 (2006.01)

H01L 29/12 (2006.01)

(52) **U.S. Cl.** **257/43**; 257/E21.464; 438/101; 438/109

(58) **Field of Classification Search** 257/43, 257/E21.464; 438/101, 109
See application file for complete search history.

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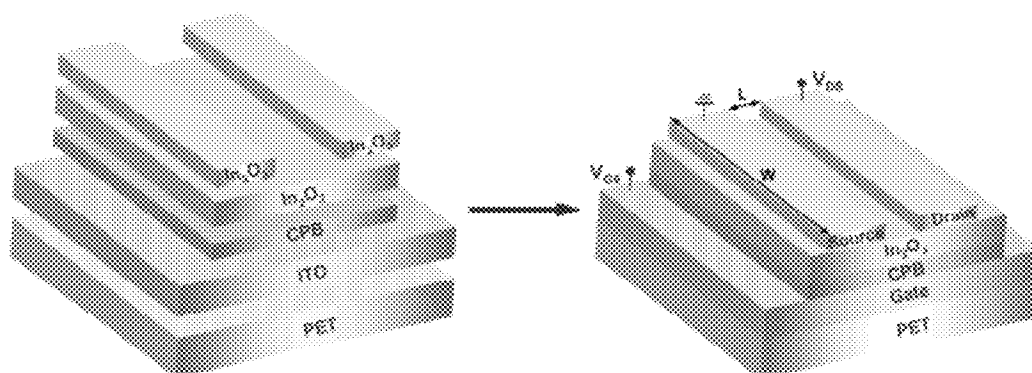
Primary Examiner — Telly Green

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(57) **ABSTRACT**

Inorganic semiconducting compounds, composites and compositions thereof, and related device structures.

20 Claims, 21 Drawing Sheets



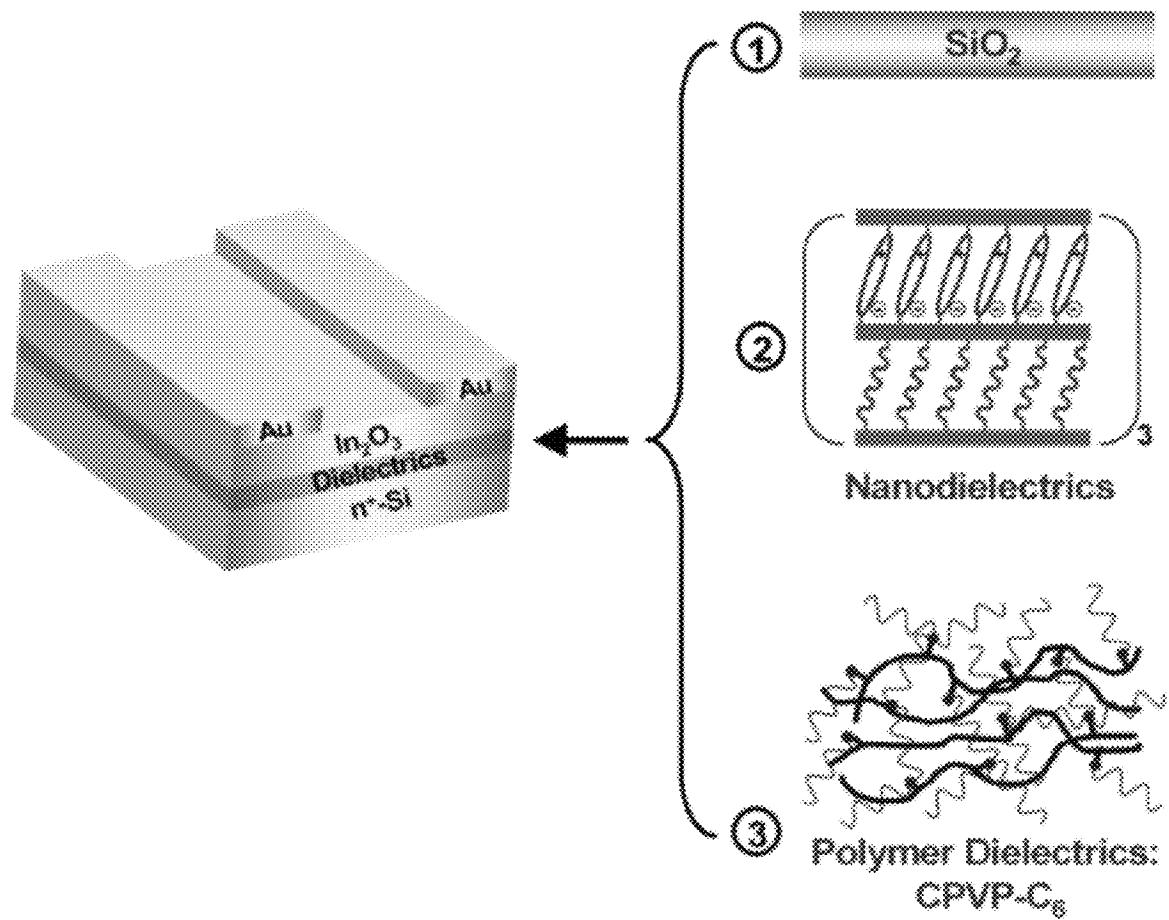


Figure 1(A).

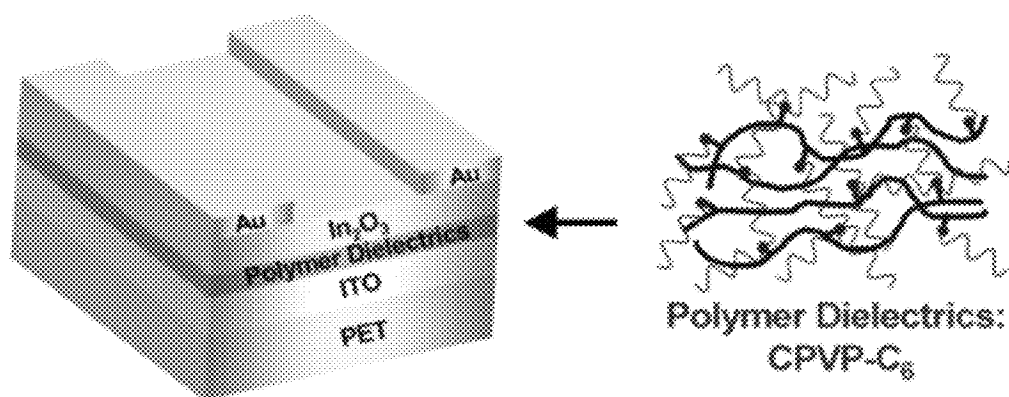


Figure 1(B).

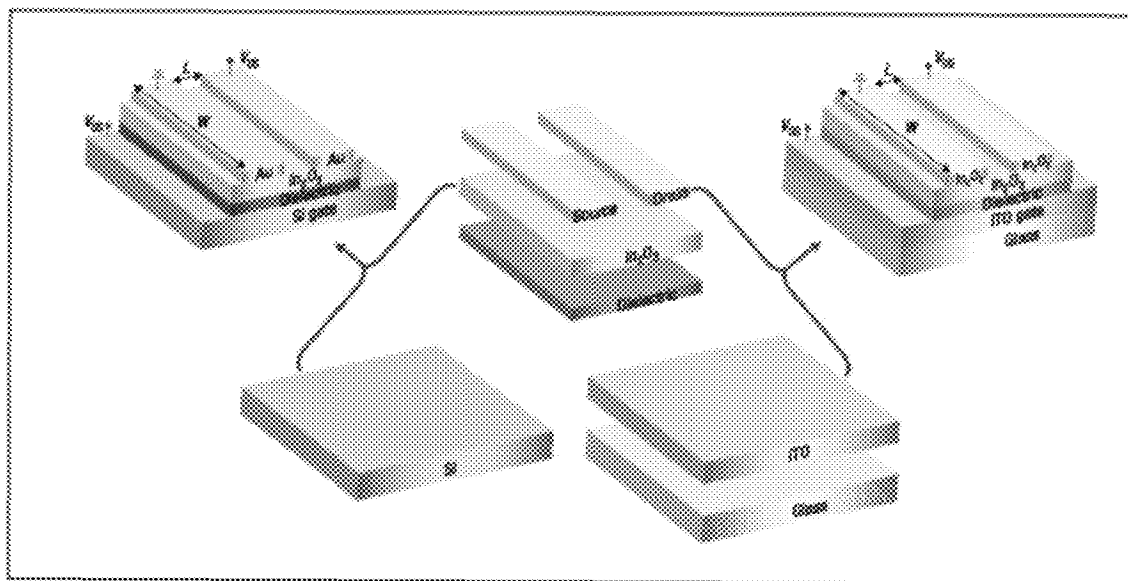


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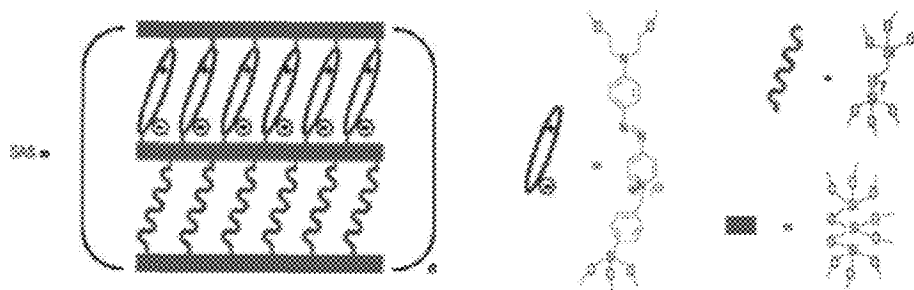


Figure 1(D).

Figure 1(E).

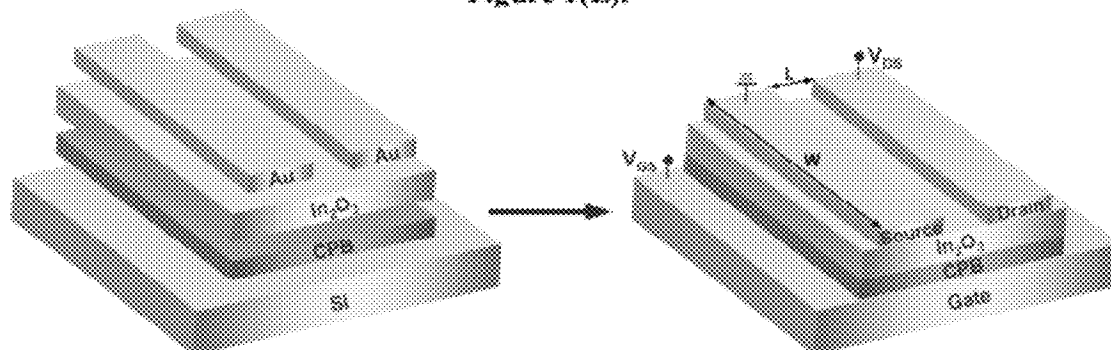


Figure 1(F).

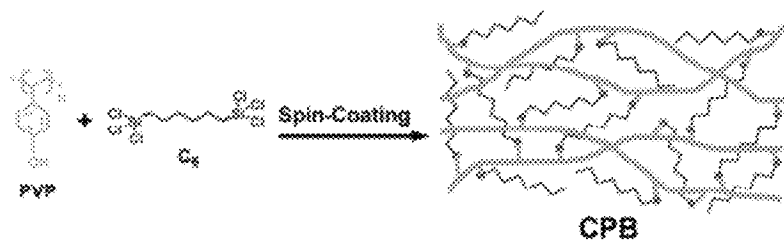
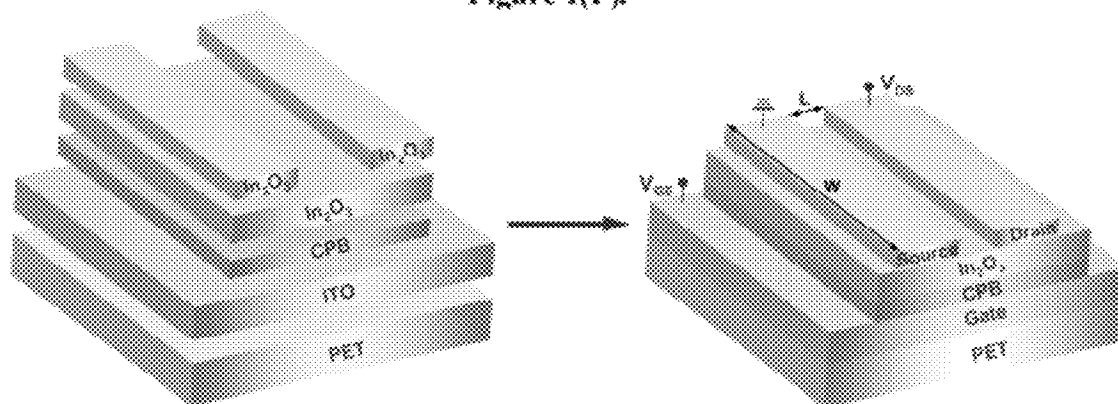


Figure 1(G).

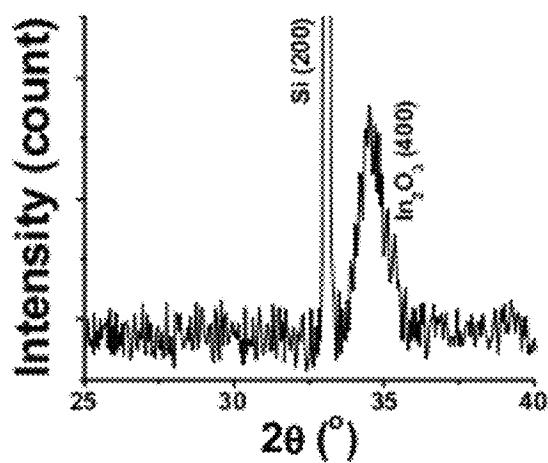


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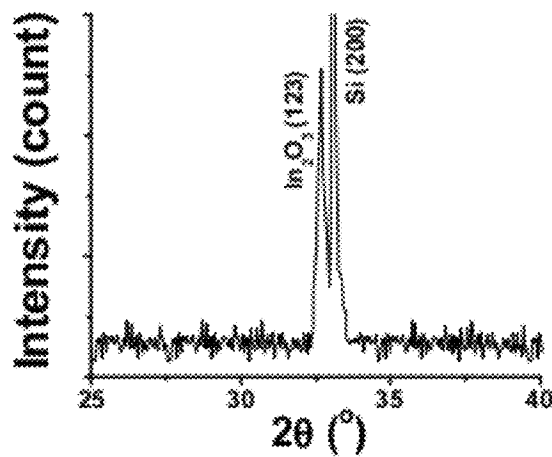


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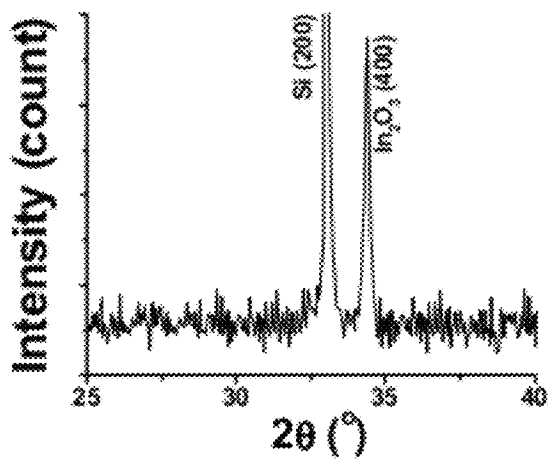


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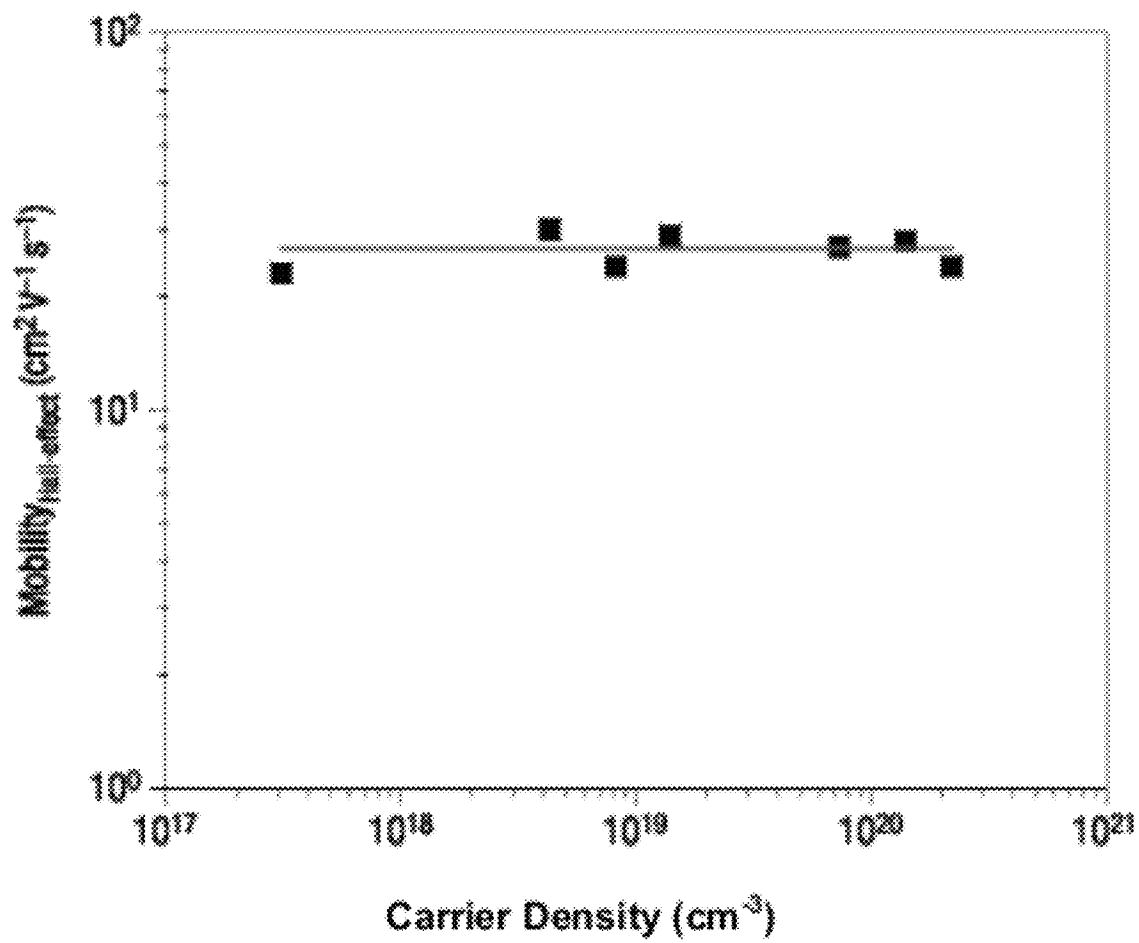


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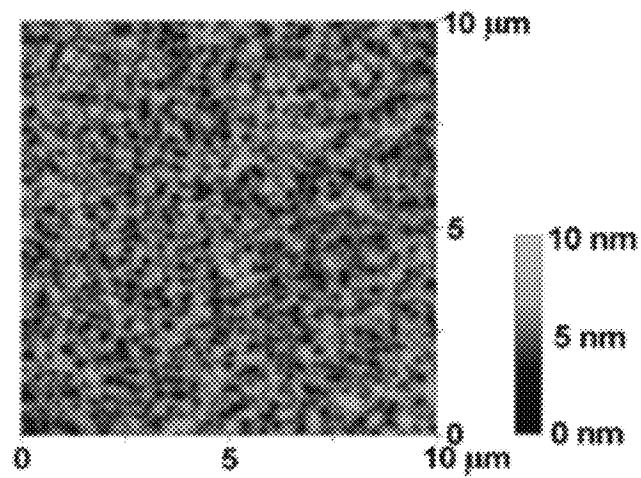


Figure 3(A).

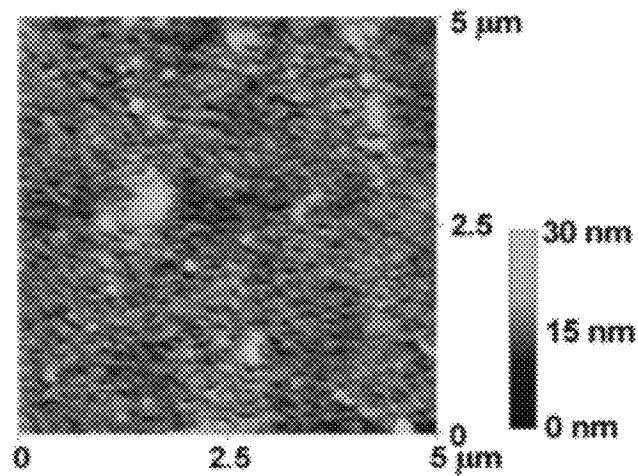


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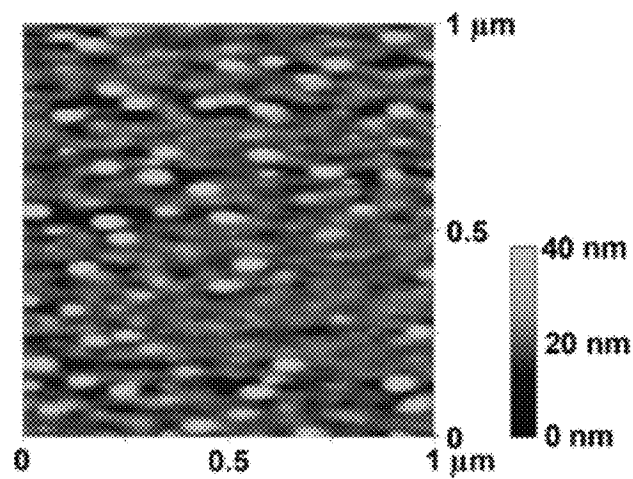


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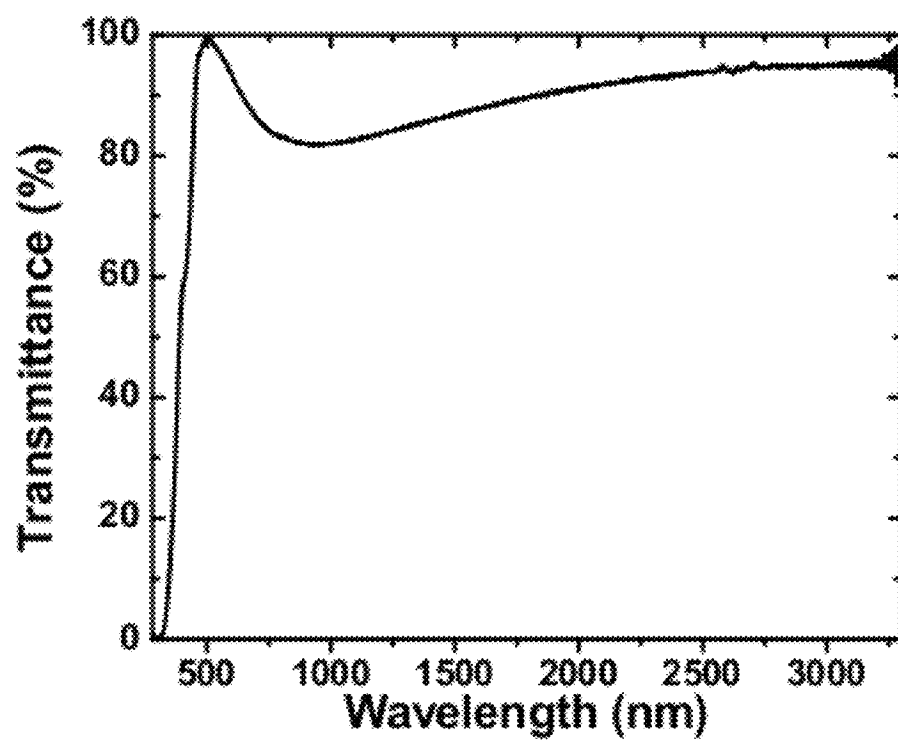


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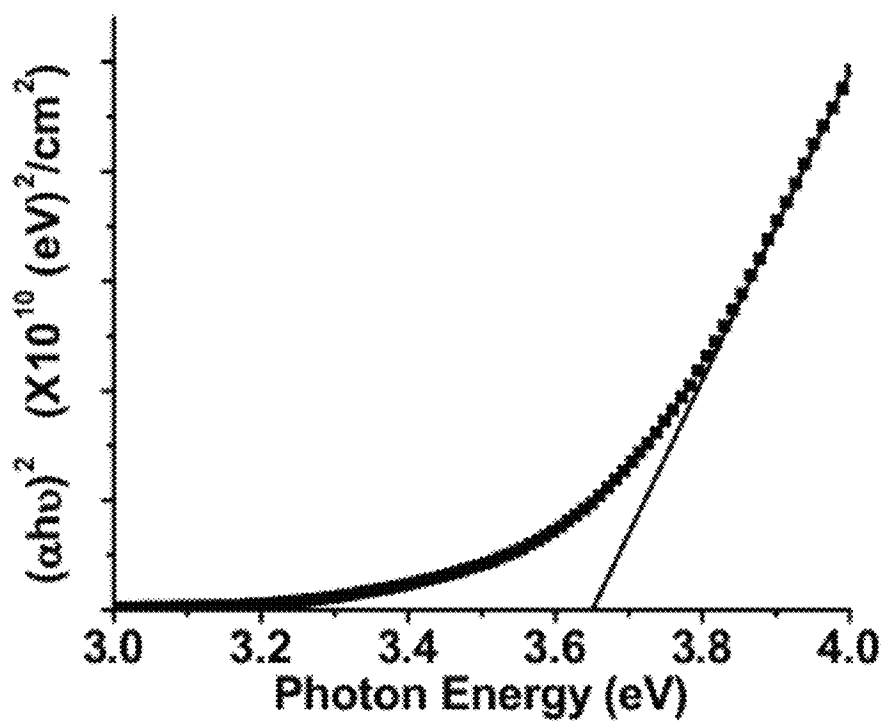


Figure 4(B).

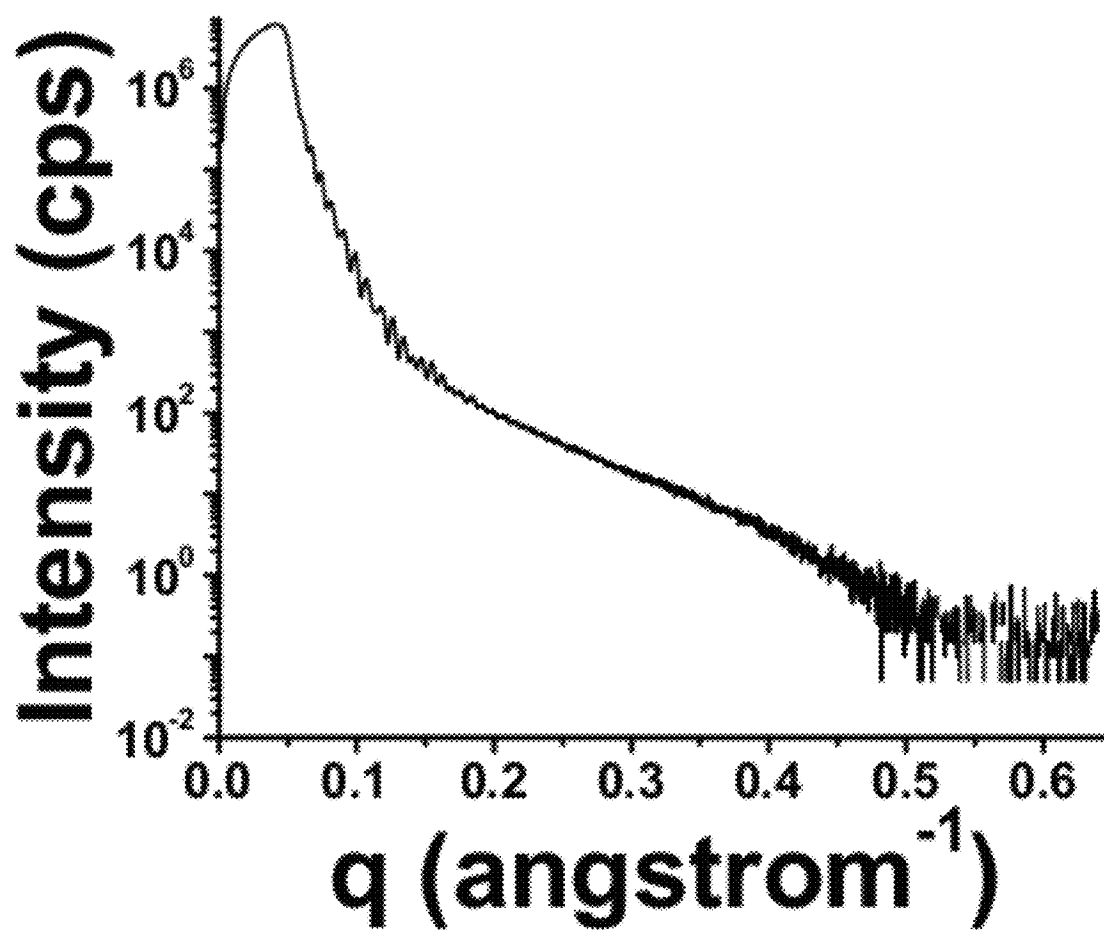


Figure 5.

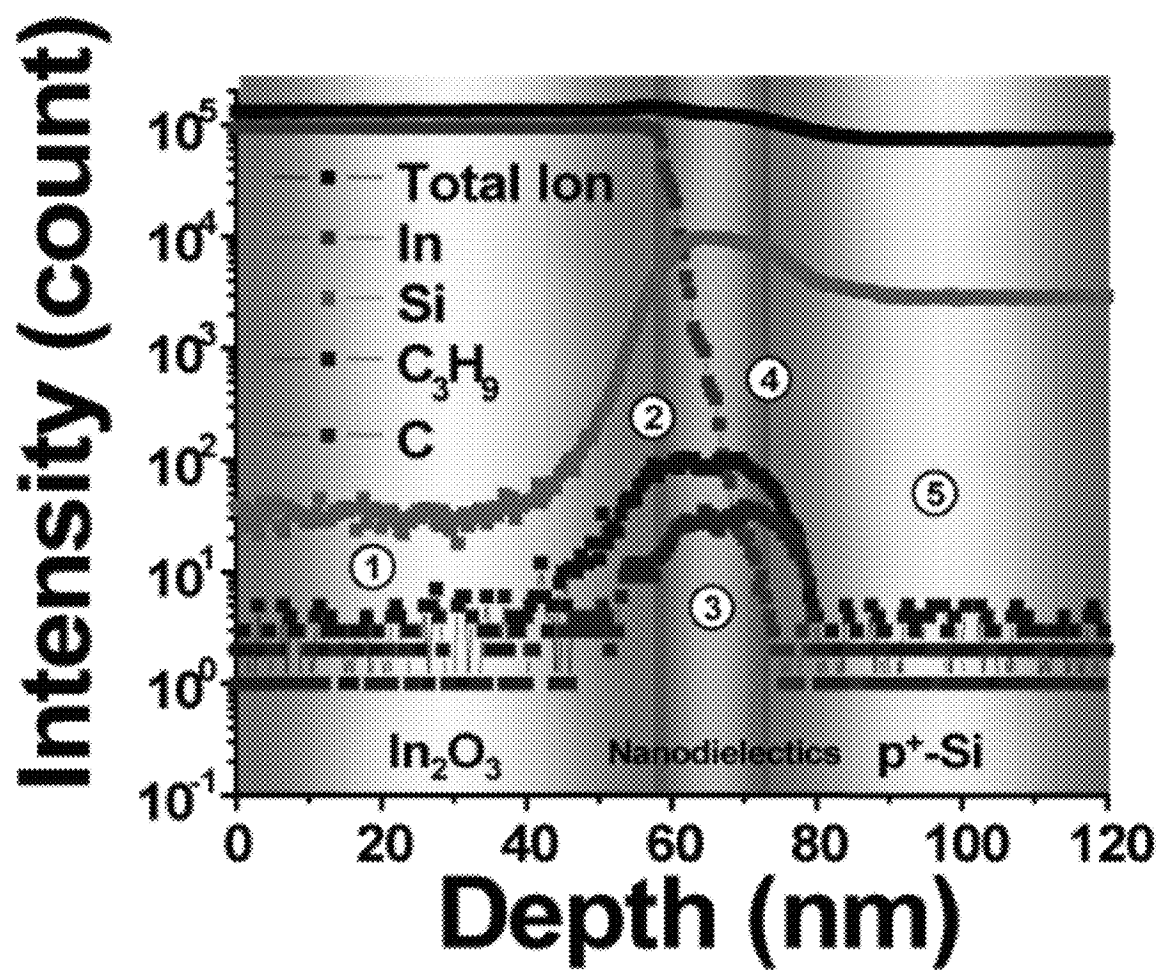


Figure 6.

Fig. 7

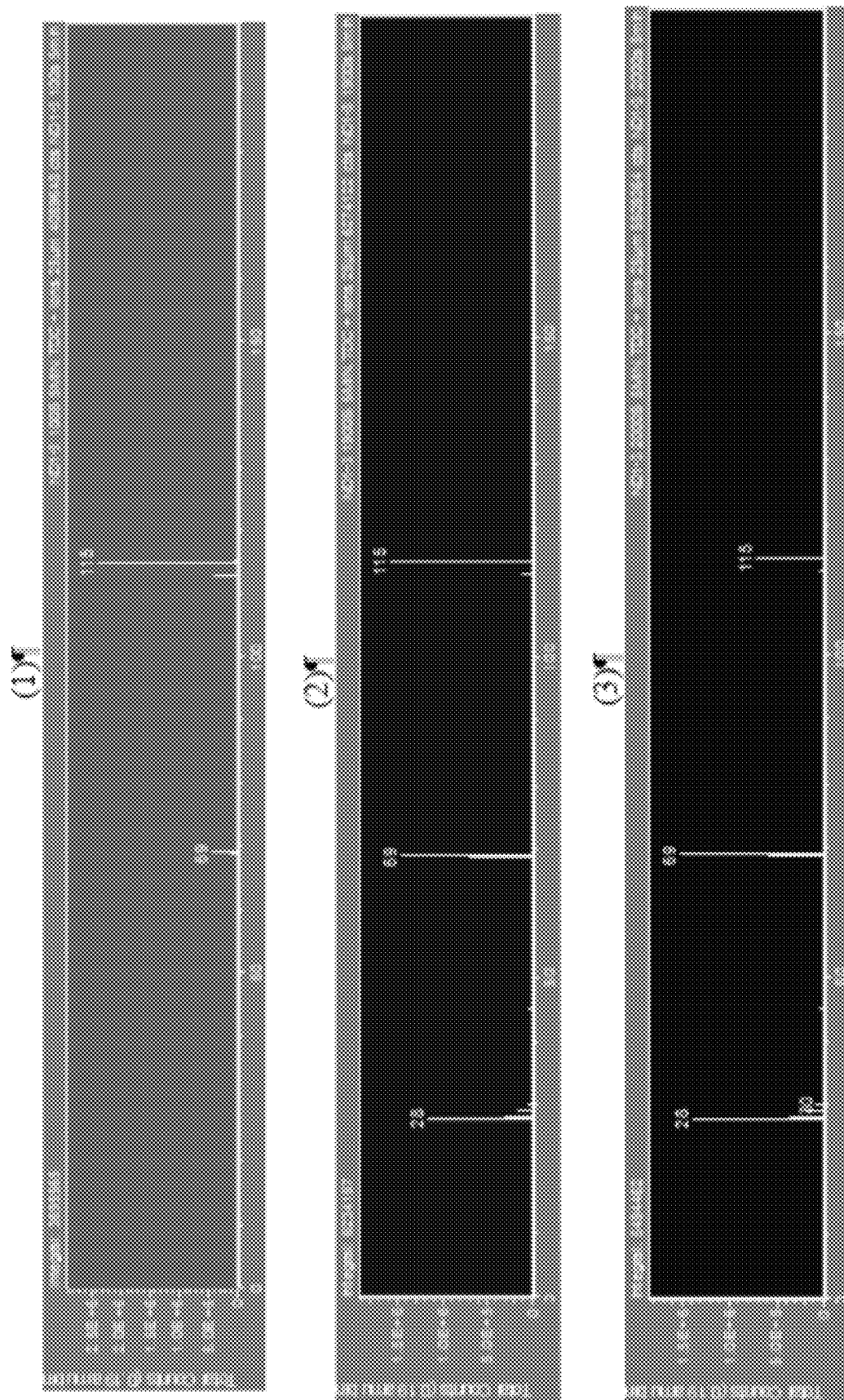


Fig. 7 (continued)

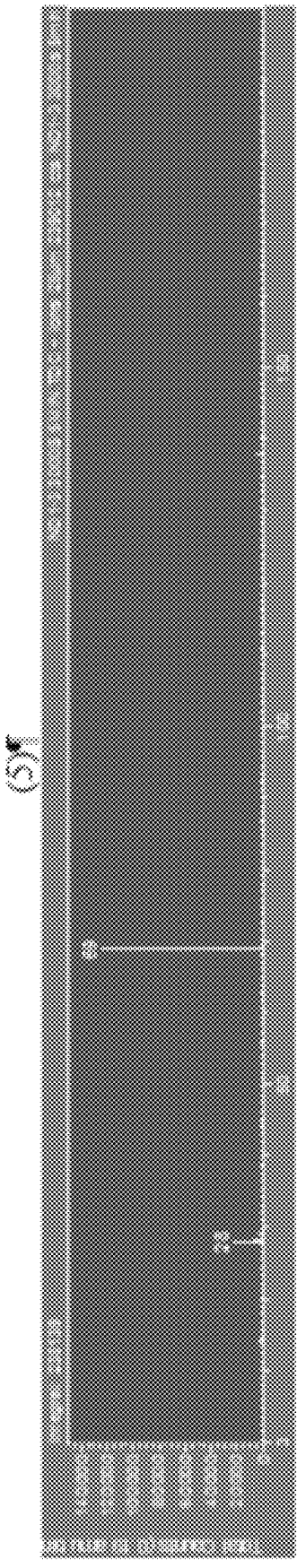
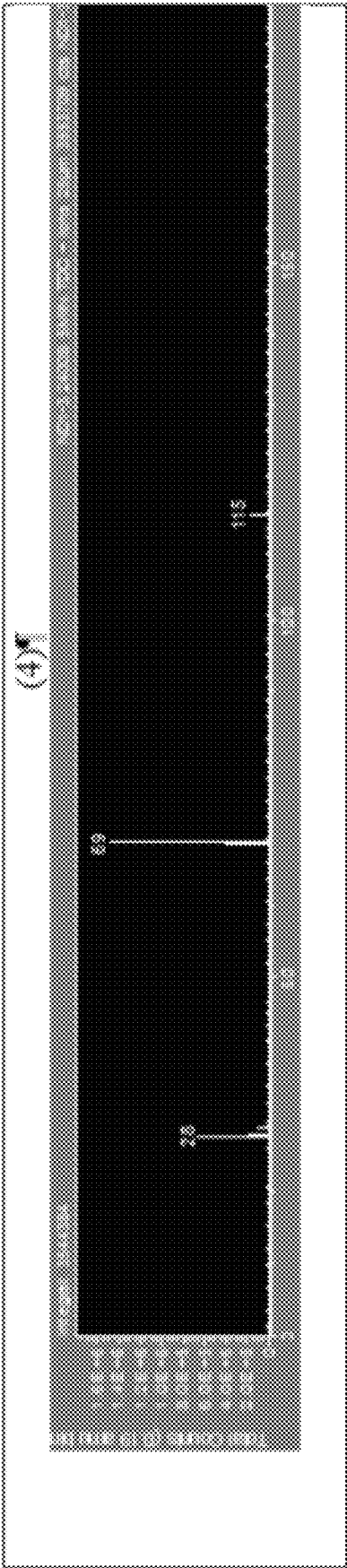


Fig. 8A

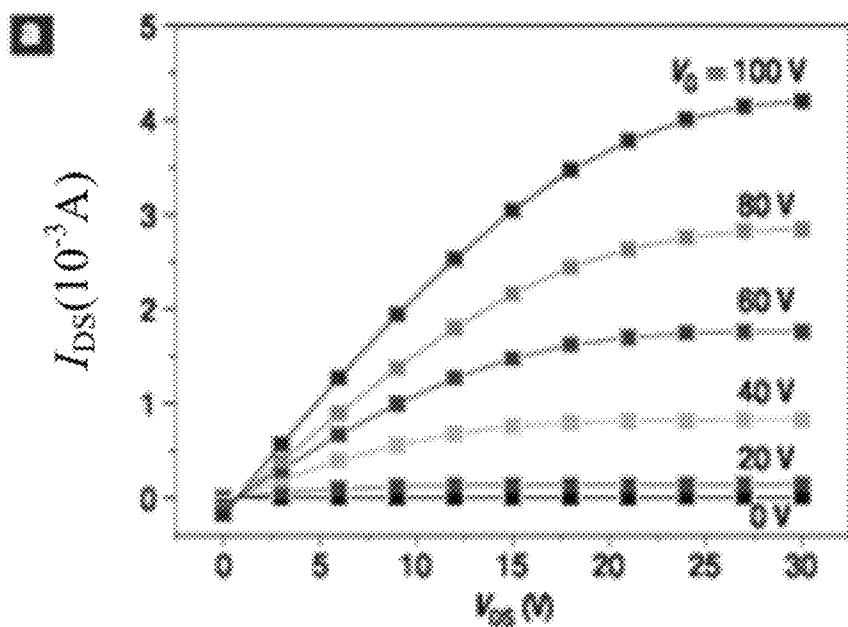


Fig 8B

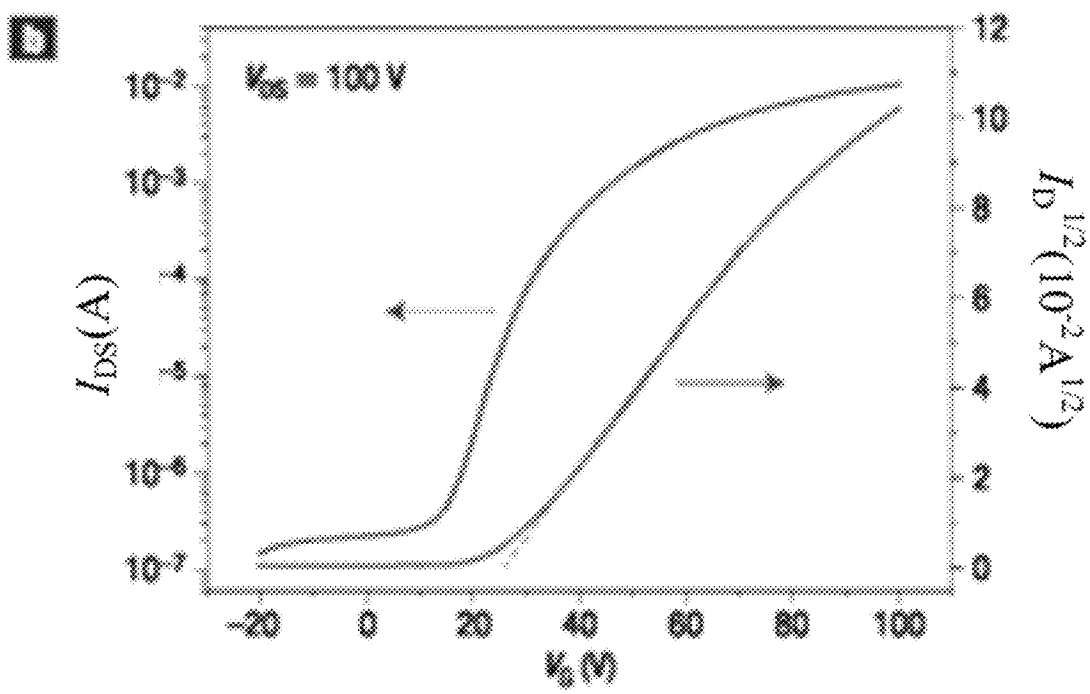


Fig. 8C

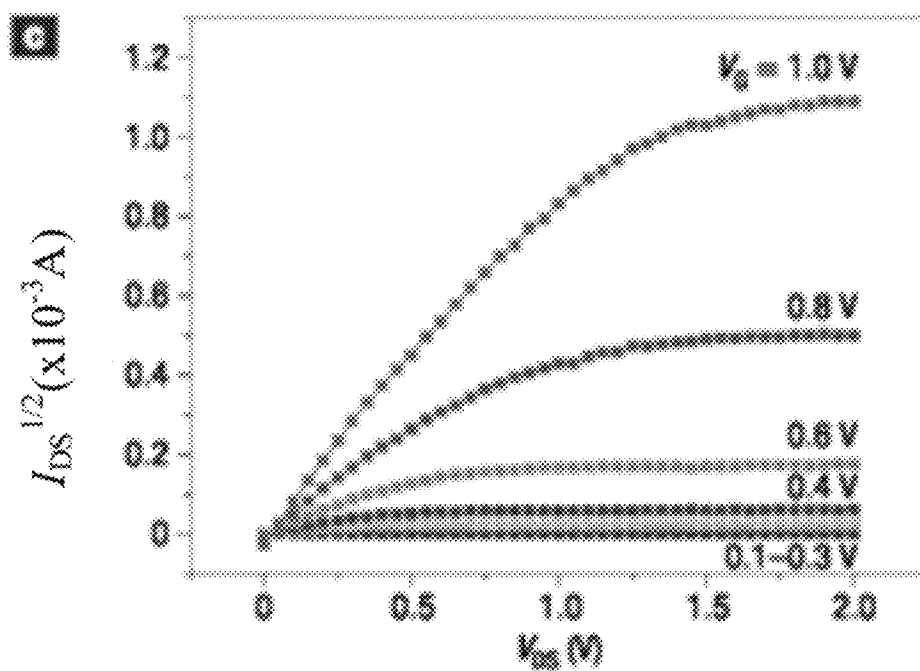


Fig. 8D

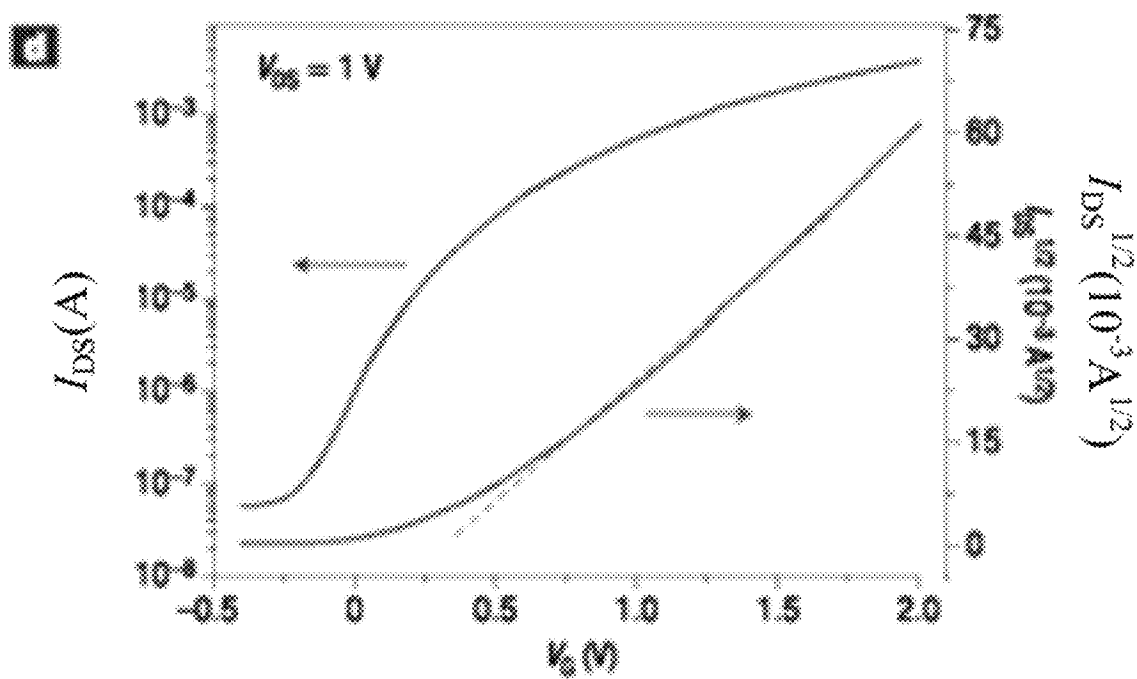


Fig. 8E

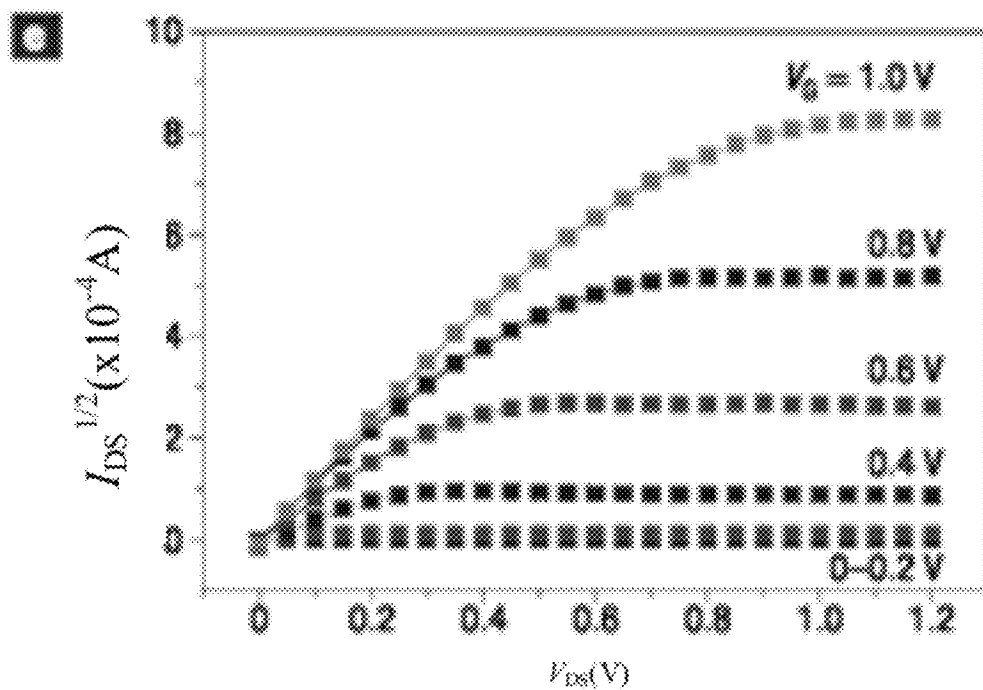


Fig. 8F

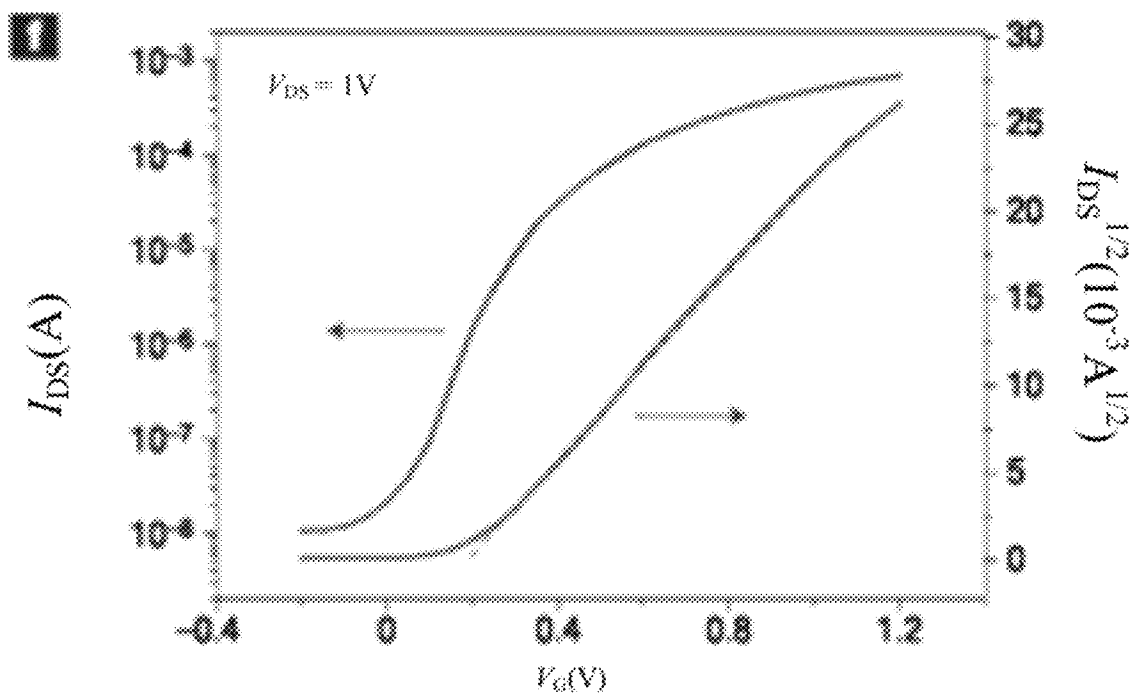


Fig. 8G

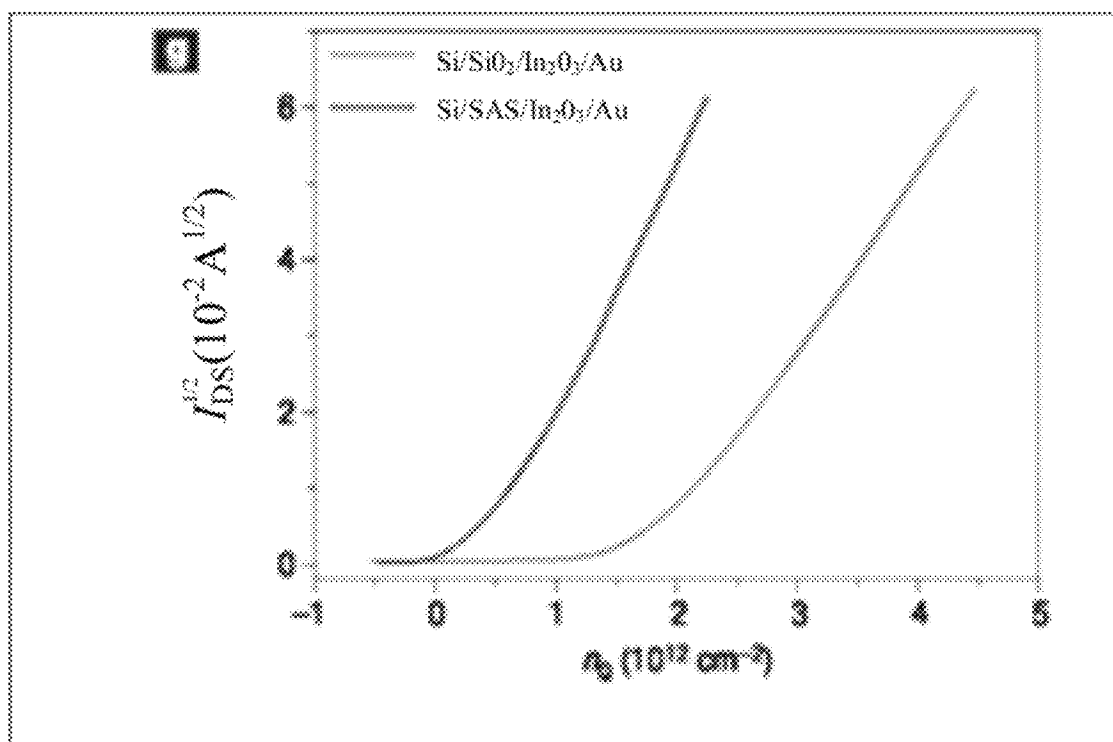


Figure 9A

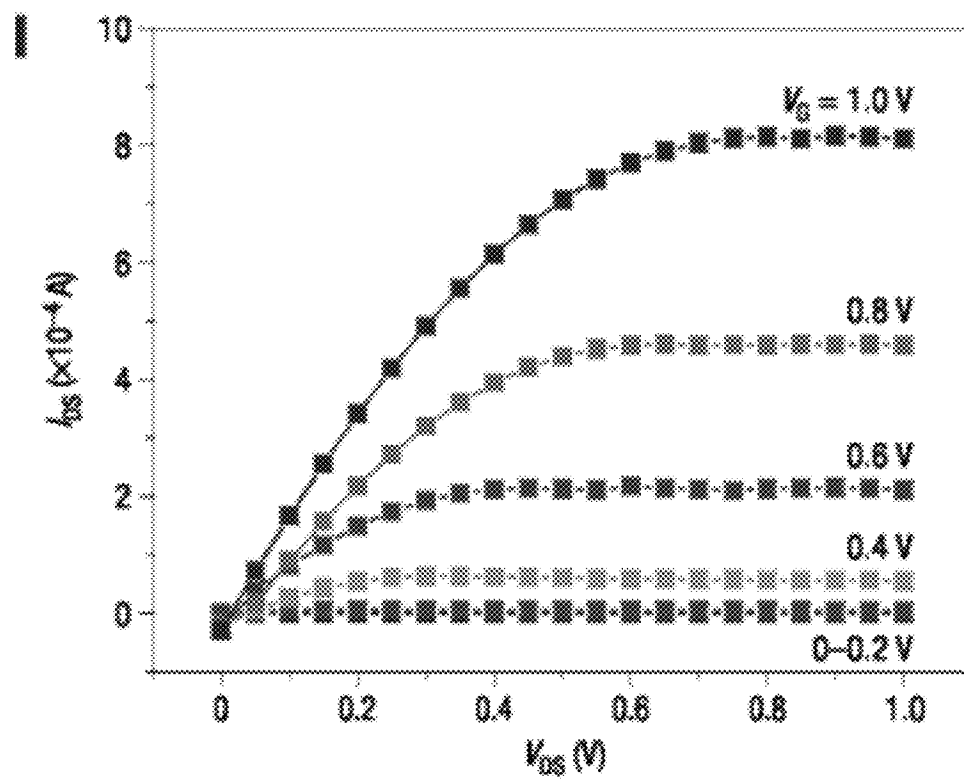


Figure 9B

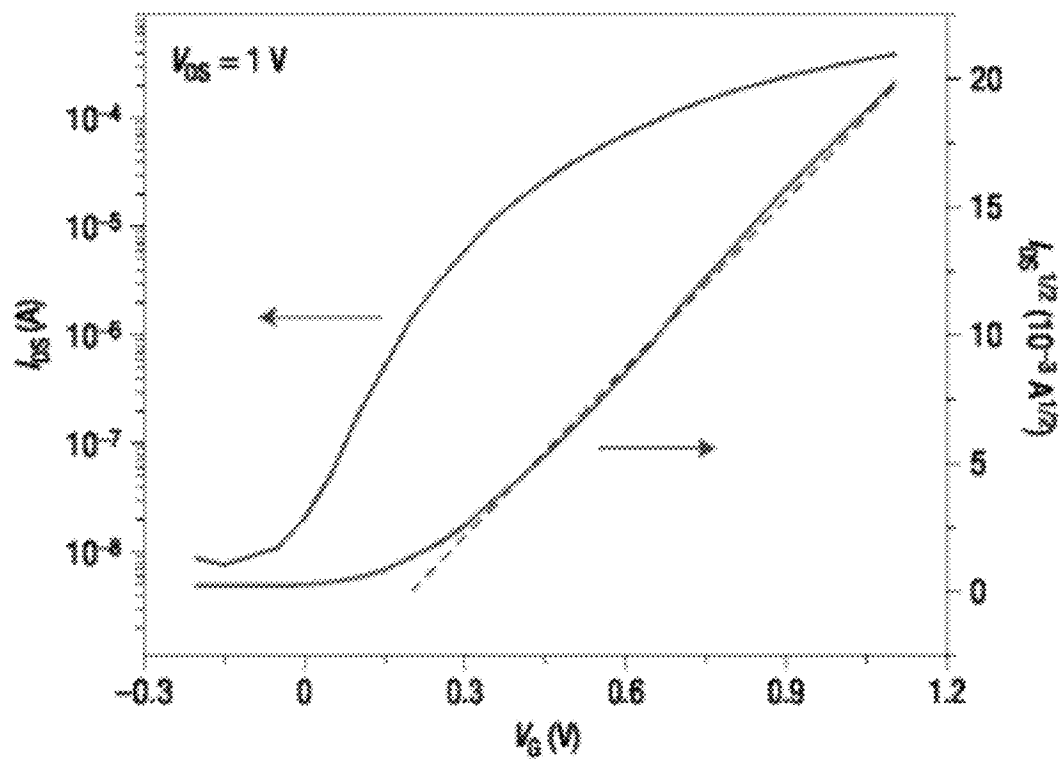


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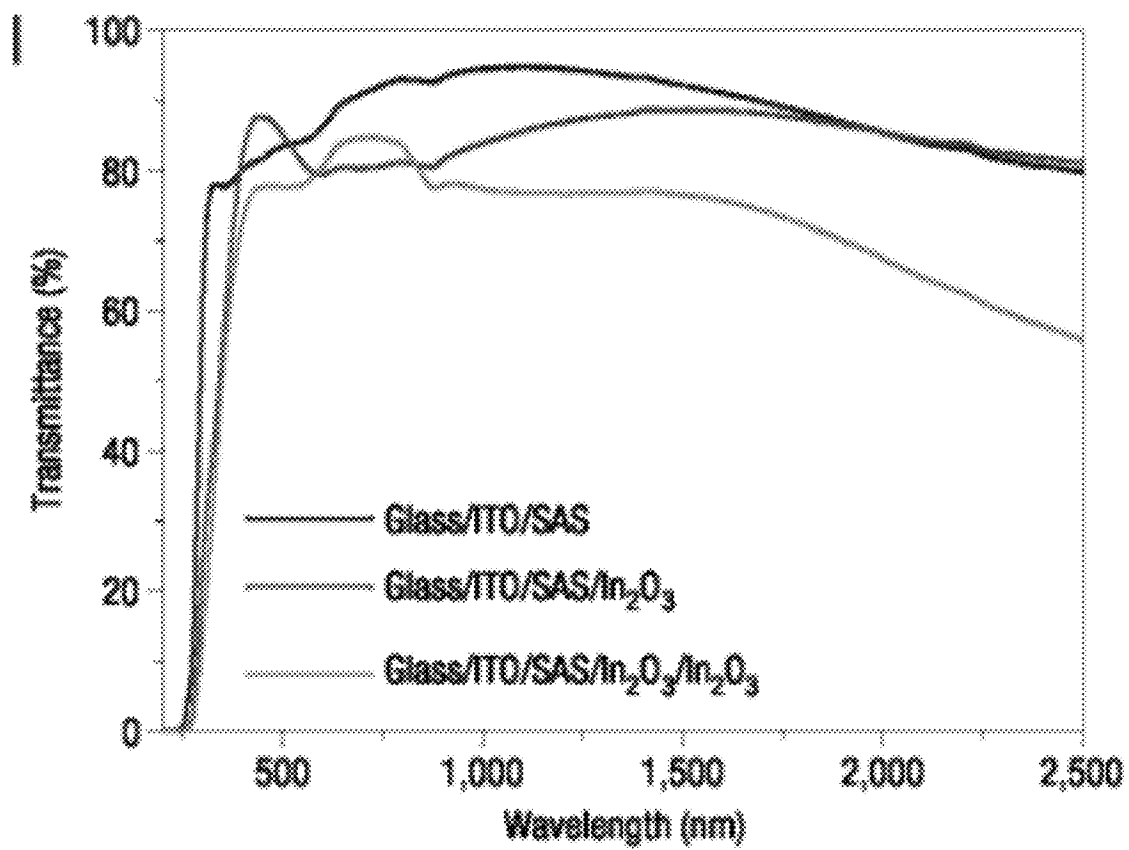


Figure 10

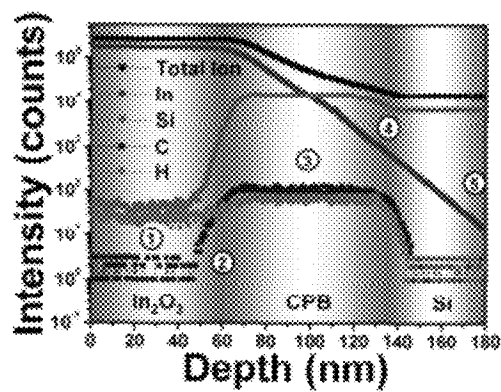


Fig. 11A

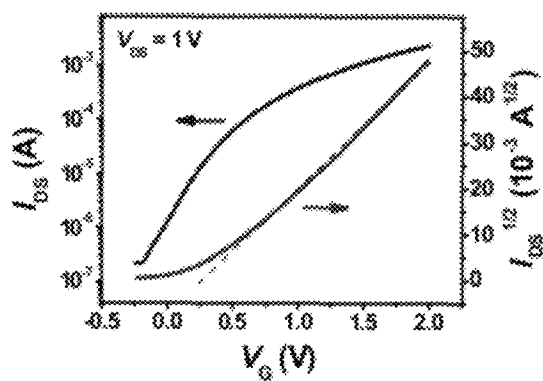


Fig. 11B

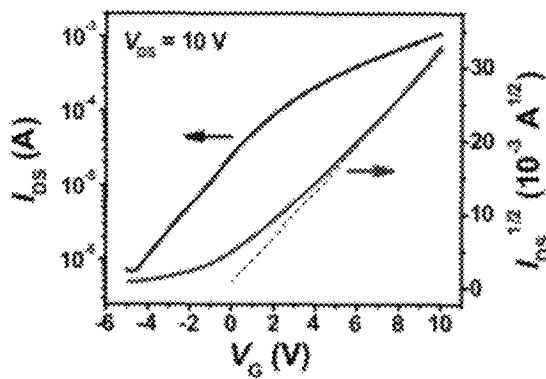
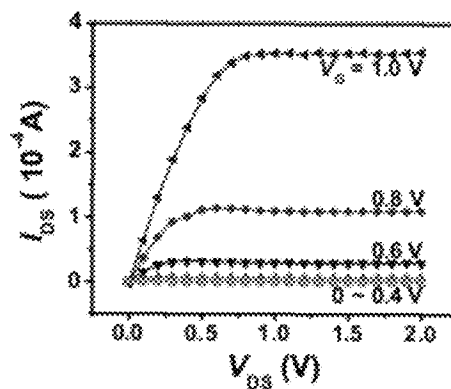


Fig. 11C

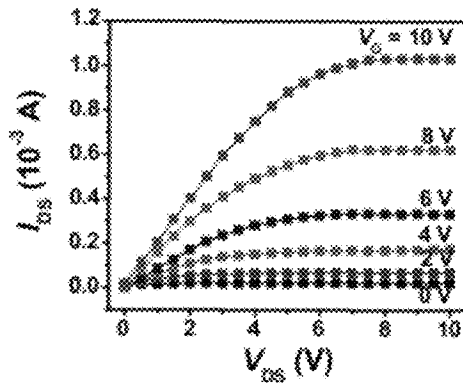


Fig. 11D

Figure 12A

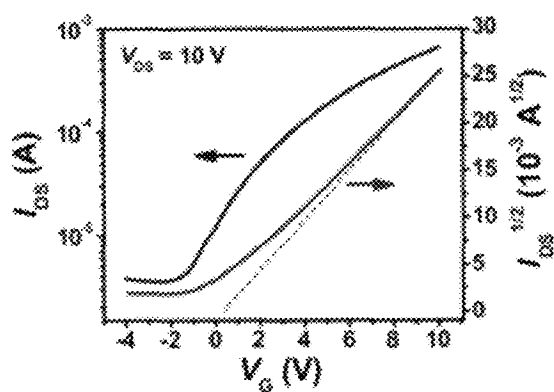


Figure 12B

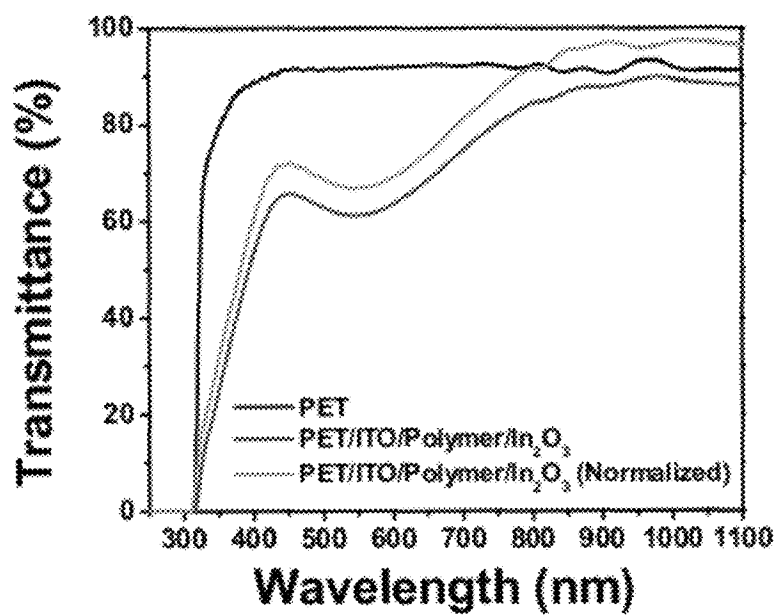
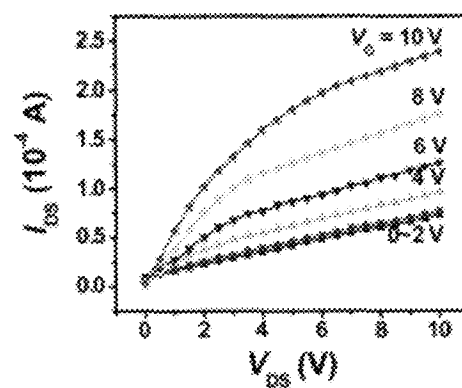


Figure 12C