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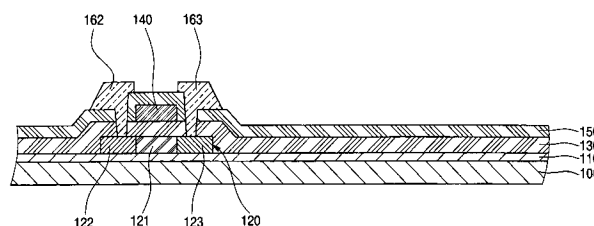
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(54) **Thin film transistor method of fabricating the same organic light emitting diode display device including the same and method of fabricating the same**

(57) A thin film transistor includes a substrate, a semiconductor layer disposed on the substrate, including a channel region and source and drain regions and crystallized using a metal catalyst, a gate electrode disposed to correspond to a predetermined region of the semiconductor layer, a gate insulating layer disposed between the gate electrode and the semiconductor layer to insulate the semiconductor layer from the gate electrode, and

source and drain electrodes electrically connected to the source and drain regions of the semiconductor layer, respectively. The metal catalyst within 15 nm (150Å) from a surface of the semiconductor layer in a vertical direction is formed to have a concentration exceeding 0 and not exceeding 6.5×10^{17} atoms per cm^3 in the channel region of the semiconductor layer. An organic light emitting diode (OLED) display device includes the thin film transistor.

FIG. 1



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DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
X	US 6 376 862 B1 (YAMAZAKI SHUNPEI [JP]) 23 April 2002 (2002-04-23) * paragraph [0215] - paragraph [0217]; figures 6,7 *	1-14	INV. H01L27/12 H01L21/77	
X	----- US 6 066 518 A (YAMAZAKI SHUNPEI [JP]) 23 May 2000 (2000-05-23) * column 7, line 49 - column 8, line 4; figure 5 *	1-14		
X	----- US 2002/094612 A1 (NAKAMURA OSAMU [JP] ET AL) 18 July 2002 (2002-07-18) * paragraph [0210] - paragraph [0211]; figures 20,21 *	1-14		
X	----- US 6 162 667 A (FUNAI TAKASHI [JP] ET AL) 19 December 2000 (2000-12-19) * column 43, line 36 - line 62 * * column 51, line 19 - column 56, line 40 *	1-14		
X	----- US 2002/164843 A1 (YAMAZAKI SHUNPEI [JP] ET AL) 7 November 2002 (2002-11-07) * paragraph [0096] * * paragraph [0106] * * paragraph [0248] - paragraph [0253] * * figures 19-24 *	1-14		TECHNICAL FIELDS SEARCHED (IPC)
X	----- EP 0 651 431 A2 (SEMICONDUCTOR ENERGY LAB [JP] SEMICONDUCTOR ENERGY LAB) 3 May 1995 (1995-05-03) * column 11, line 27 - column 12, paragraph 6; figures 4,5 *	1-14		H01L
X	----- US 2004/084675 A1 (KOYAMA JUN [JP] ET AL) 6 May 2004 (2004-05-06) * paragraph [0112] - paragraph [0115] *	1-14		
The present search report has been drawn up for all claims				
Place of search		Date of completion of the search	Examiner	
Berlin		25 May 2010	Hoffmann, Niels	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document		
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Application Number
EP 08 25 2217

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 6 528 820 B1 (YAMAZAKI SHUNPEI [JP] ET AL) 4 March 2003 (2003-03-04) * column 3, line 60 - column 4, line 24 * -----	1-14	
X	US 2006/030085 A1 (PARK HYE-HYANG [KR] ET AL) 9 February 2006 (2006-02-09) * paragraph [0027]; claim 10 * -----	1-14	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
Place of search Berlin		Date of completion of the search 25 May 2010	Examiner Hoffmann, Niels
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 25 2217

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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25-05-2010

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
US 6376862	B1	23-04-2002	JP 3472024 B2	02-12-2003
			JP 9232236 A	05-09-1997
US 6066518	A	23-05-2000	JP 3939399 B2	04-07-2007
			JP 11040500 A	12-02-1999
US 2002094612	A1	18-07-2002	KR 20020061544 A	24-07-2002
US 6162667	A	19-12-2000	CN 1132927 A	09-10-1996
US 2002164843	A1	07-11-2002	NONE	
EP 0651431	A2	03-05-1995	CN 1110004 A	11-10-1995
			CN 1223459 A	21-07-1999
			CN 1238553 A	15-12-1999
			DE 69430097 D1	18-04-2002
			DE 69430097 T2	31-10-2002
			KR 100273831 B1	15-01-2001
			US 2009035923 A1	05-02-2009
			US 5643826 A	01-07-1997
US 2004084675	A1	06-05-2004	US 2009231533 A1	17-09-2009
US 6528820	B1	04-03-2003	CN 1163487 A	29-10-1997
			JP 3645380 B2	11-05-2005
			JP 9312404 A	02-12-1997
US 2006030085	A1	09-02-2006	KR 20060012850 A	09-02-2006

专利名称(译)	薄膜晶体管的制造方法包括相同的有机发光二极管显示装置及其制造方法		
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其他公开文献	EP2009695A2		
外部链接	Espacenet		

摘要(译)

薄膜晶体管包括衬底，设置在衬底上的半导体层，包括沟道区和源区和漏区并使用金属催化剂结晶，栅电极设置为对应于半导体层的预定区域，栅极绝缘设置在栅电极和半导体层之间的层使半导体层与栅电极绝缘，并且源电极和漏电极分别电连接到半导体层的源区和漏区。在垂直方向上距半导体层表面15nm (150) 内的金属催化剂形成为在半导体层的沟道区中具有超过0且不超过 6.5×10^{17} 原子/ cm^3 的浓度。有机发光二极管 (OLED) 显示装置包括薄膜晶体管。

FIG. 1

