

	(19) (12)	(KR) (A)	(11) (43)	10-2010-0040439 2010 04 20
(51)	Int. Cl.		(71)	
	<i>G01B 7/06</i> (2006.01)	<i>G01B 7/00</i> (2006.01)		
(21)	10-2008-0099539			98
(22)	2008 10 10		(72)	
	2008 10 10			521
			108-304	
				1 281-176 404
			(	)
			(74)	
				,
	:	19		

(54)

(57)

,

,

,

,

.

- 7

4
2
1
3

(72)

367-4

B03

3

102

304

1

,

;

;

.

2

1

,

1

2

1

2

,

1

2

.

3

1

,

1

2

1

2

,

1

2

.

4

1

,

.

5

1

,

.

6

2

3

,

Quartz-Crystal, gallium orthophosphate(GaPO_4), Langasite($\text{La}_3\text{Ga}_5\text{SiO}_{14}$, LGS)

.

7

2

3

,

.

8

7

,

Ta, TaN, Ti, TiN, WN, Si, W, Ru, Pt

.

9

2 3 ,

.

10

9 ,

Cu, Al, Ti, Co, Ni, W, Ru, Pt, Au, Ag, Ta, TaN, Ti, TiN, WN

.

11

1 ,

(ALD)

(CVD)

.

12

,

,

.

13

12 ,

1 2 1 2 ,

1 2 .

14

12 ,

1 2 1 2 ,

1 2 .

15

12 14 ,

.

16

12 14 ,

.

17

16 ,

Ta, TaN, Ti, TiN, WN, Si, W, Ru, Pt .

18

12 14 ,

19

18 ,
Cu, Al, Ti, Co, Ni, W, Ru, Pt, Au, Ag, Ta, TaN, Ti, TiN, WN

[0001]

[0002]

(in situ)
(thickness), (composition), (impurity concentration), (step
coverage), (stress)

[0003]

(IC fabrication)
(in situ)
(ellipsometry) - (quartz-crystal microbalance)

[0004]

(oscilliating frequency)

[0005]

[0006]

[0007]

[0008]

[0009]

1 2 1 2
1 2

[0010]

1 2 1 2

1 2

[0011]

[0012]

[0013] (Quartz-Crystal), (gallium orthophosphate, GaPO₄),
(Langasite)(La₃Ga₅SiO₁₄, LGS)

[0014] Ta, TaN, Ti, TiN, WN, Si, W, Ru,
Pt

[0015] Cu, Al, Ti, Co, Ni, W, Ru, Pt, Au,
Ag, Ta, TaN, Ti, TiN, WN

[0016] (ALD) (CVD)

[0017]

[0018]

[0019]

[0020]

[0021]

1 9

[0022] (Atomic Layer Deposition, ALD) (Chemical Vapor
Deposition, CVD)
(LED)

[0023] 1 , 2

3

[0024] Al₂O₃ (Al) (precursor)
TMA(trimethyl aluminum, Al(CH₃)₃) (H₂O) TMA
(pulse) , TMA
H₂O (purge)

, TMA -> -> H₂O -> 1
Al₂O₃

[0025] Al₂O₃

TMA H₂O (pulse time) . 1 ,

(self-limiting) TMA H₂O
(functional groups) .

(thermal decomposition) (desorption) . ,

[0026] 2 , 3
2
2

[0027] 3 ,
3

[0028] 4 (Q)
(10)(, (furnace)) (PC)) . (Q) (S)(,) (20)
(10) (10)

[0029] 5 , 6 5
(2,3) (1) (1)
(2,3) (10)
(, Sauerbrey Equation)
(,) .

[0030] 5 , (, -
)

[0031] , ,
 ,

(oxide)

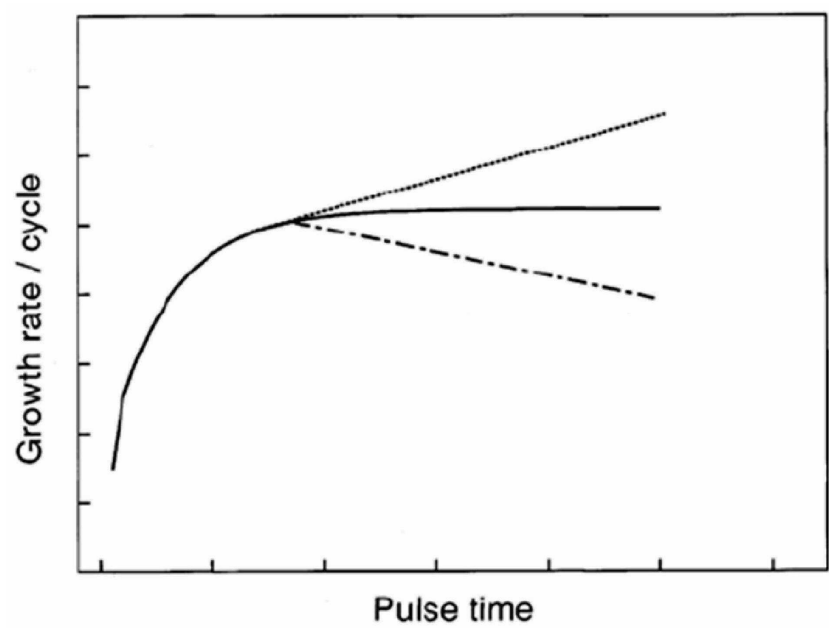
[0032] , GaPO₄ , GaPO₄
(6) . ,
(6) , /

[0033] 7 , 8 7
9 . , 7
9

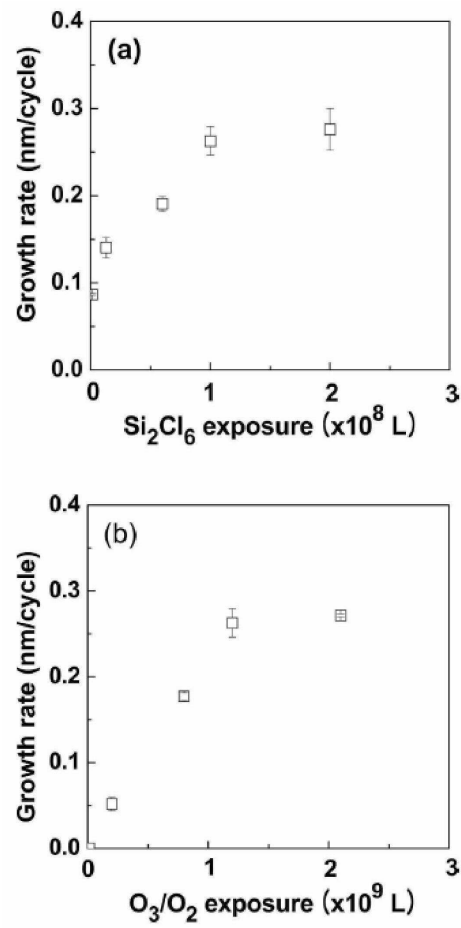
[0034] (2,3) (1) , (1) (2,3)
(1) Quartz-Crystal, gallium orthophosphate(GaPO₄), Langasite(La₃Ga₅SiO₁₄, LGS)

[0035]	,	(1)	(2)	(4)	(S10).	,	(4)
	(S)	(	, Ta, TaN, Ti, TiN, WN, Si, W, Ru, Pt	)	,	(4)	
	(Q)				(4)	(S)	
		(	, Cu, Al, Ti, Co, Ni, W, Ru, Pt, Au, Ag, Ta, TaN, Ti, TiN,				
	WN	)	.				
[0036]	(Q)	(S)	(	,	)	(S20).	
	(10)		(S)	(Q)		,	
	(S)	(4)	(S30).		(Q)		
	(S40),	(4)	(4)	,		(4)	
[0037]	(PC)		(	, Sauerbrey Equation	)	,	
				(S50).			
[0038]		(Q)		,		(	
	,	)	,				
[0039]		/		(	,	,	
						)	
						/	
[0040]							
	,						
[0041]	1						
[0042]	2						
[0043]	3						
[0044]	4						
[0045]	5						
[0046]	6	5					
[0047]	7						
[0048]	8	7					
[0049]	9						

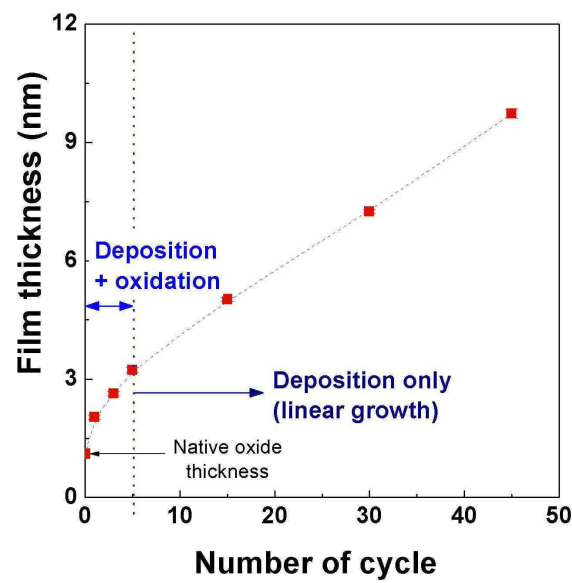
1



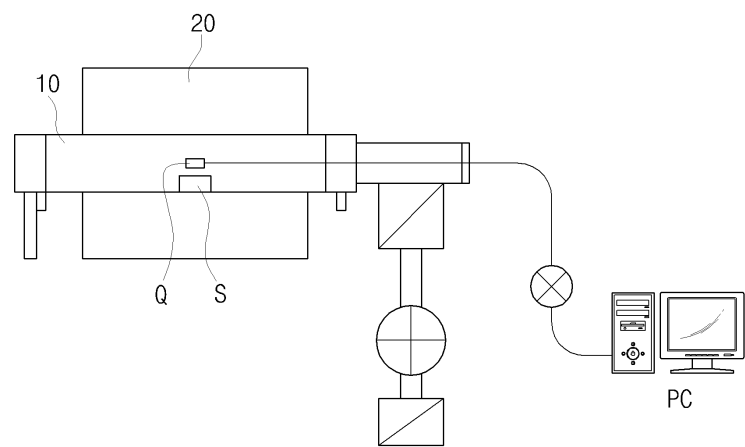
2



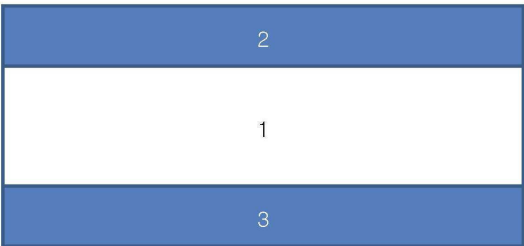
3



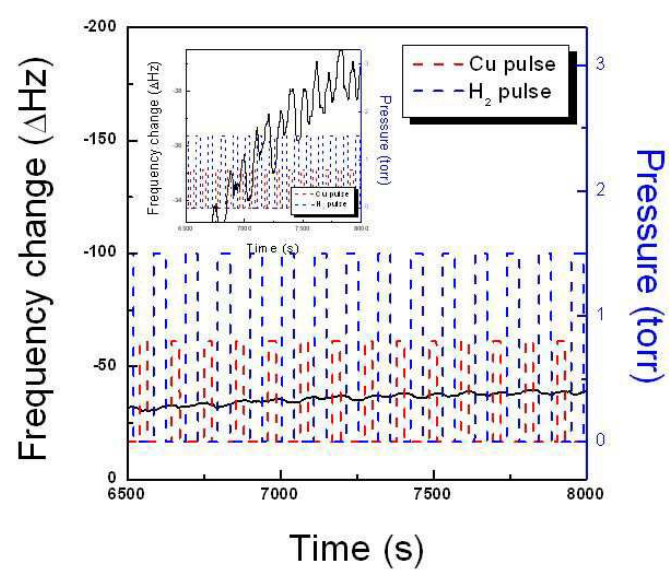
4



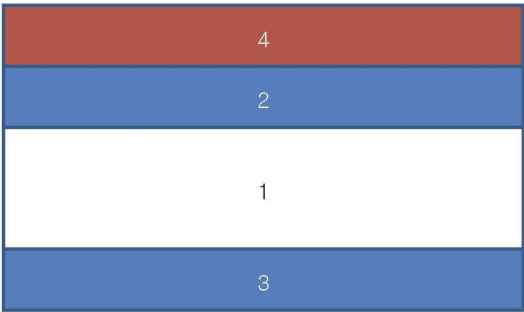
5



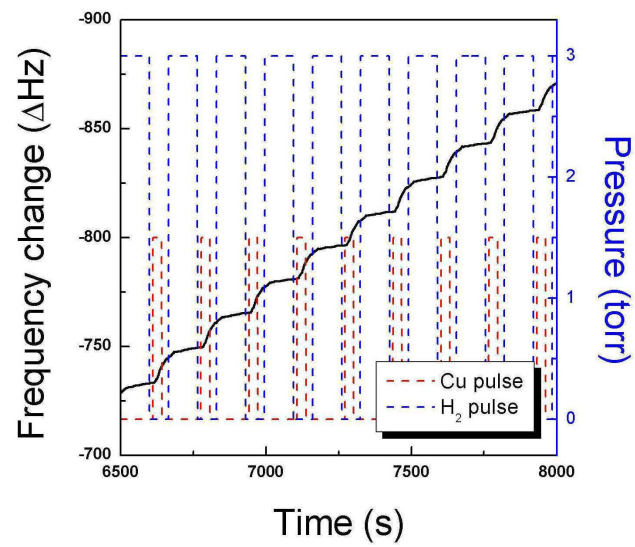
6



7



8



9

