

FIG. 1

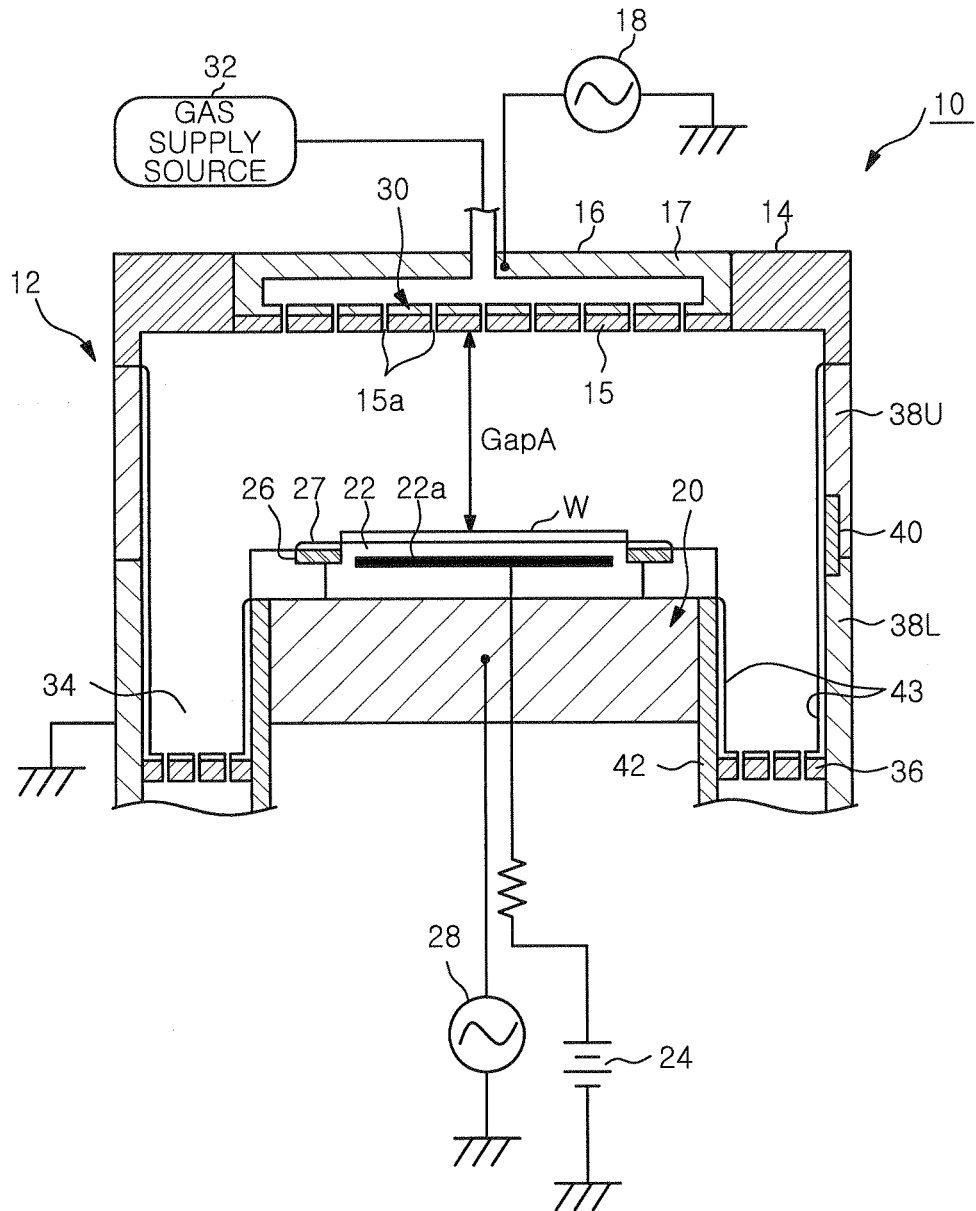


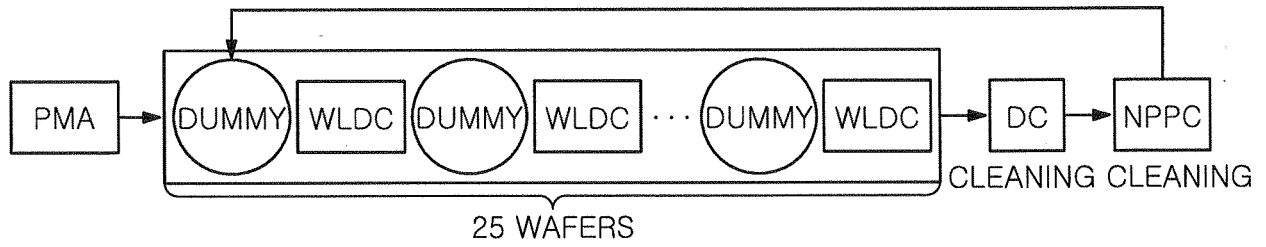
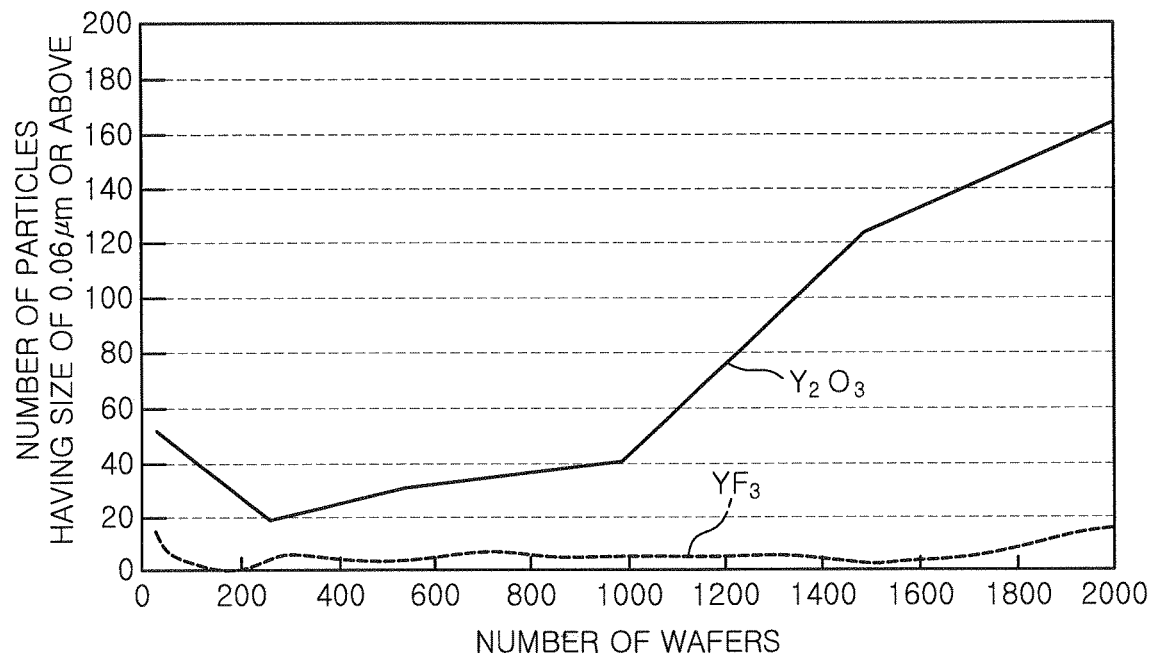
FIG. 2A*FIG. 2B*

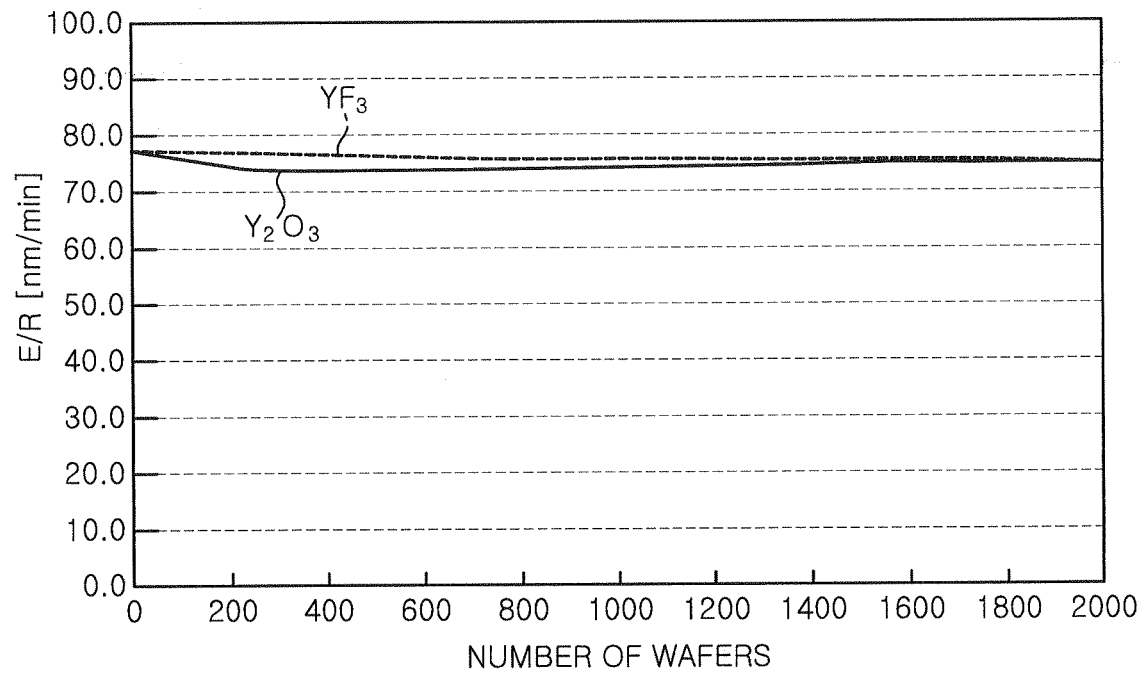
FIG. 3

FIG. 4

FILM MATERIAL (NUMBER OF WAFERS)	ICP-MS [E+10 atoms/cm ²]	Ave SS(0.06μm up) [Particle count]	EDX		
			Y[%]	Y count	Total count
Y ₂ O ₃ (25wal)	–	56	46%	12	26
Y ₂ O ₃ (1000wal)	0.13	47	91%	40	44
Y ₂ O ₃ (2000wal)	0.20	164	83%	33	40
YF ₃ (25wal)	20	15	0%	0	10
YF ₃ (100wal)	1.2	4	17%	1	6
YF ₃ (500wal)	0.43	4	0%	0	6
YF ₃ (1000wal)	0.29	6	17%	1	6
YF ₃ (1500wal)	0.28	3	17%	1	6
YF ₃ (2000wal)	0.28	13	–	–	–

FIG. 5

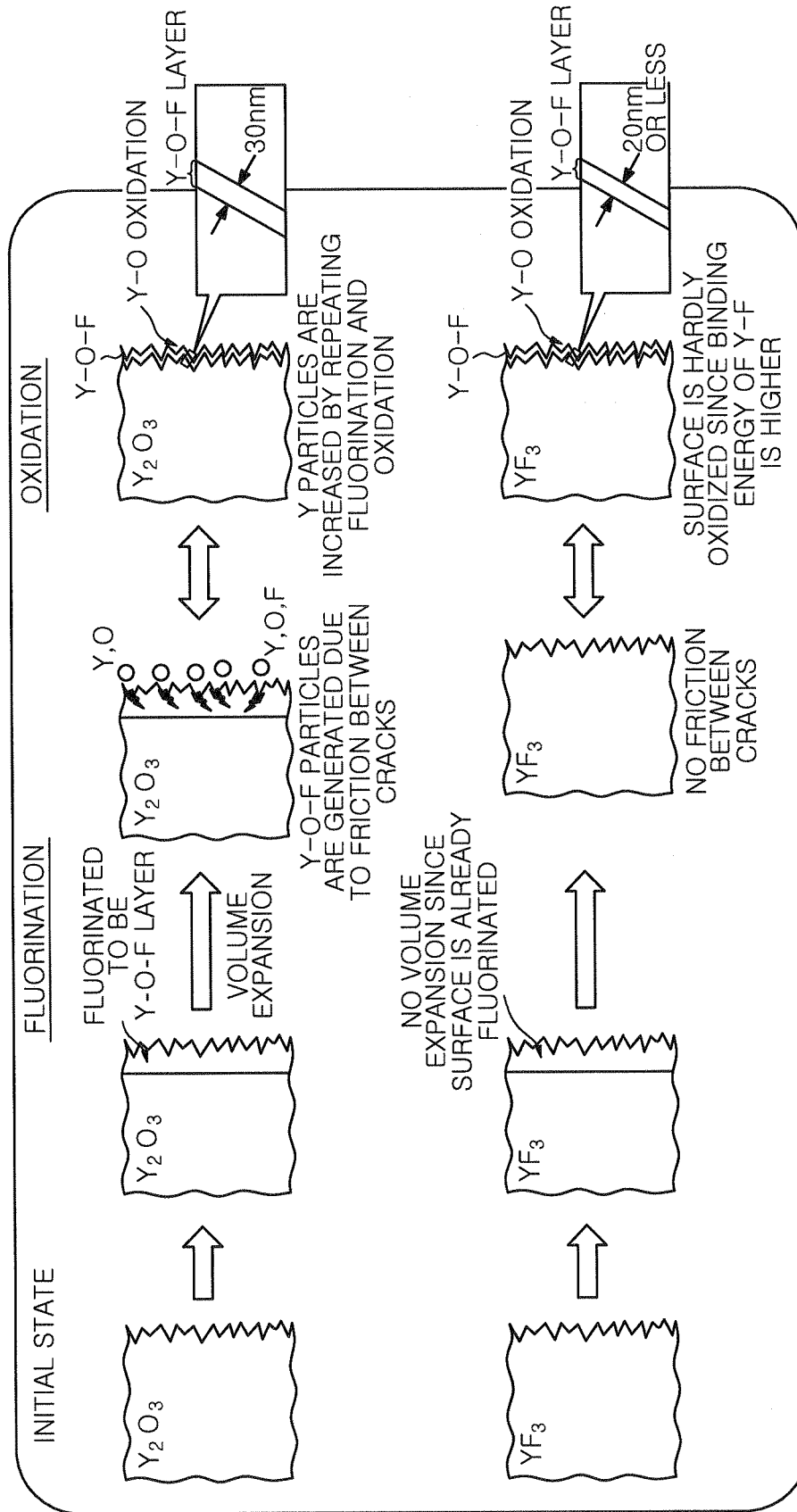


FIG. 6

RARE EARTH OXIDE	DENSITY (g/cm ³)	RARE EARTH FLUORIDE	DENSITY (g/cm ³)
Y ₂ O ₃	5.03	YF ₃	4.01
CeO ₂	7.13	CeF ₃	6.16
Sm ₂ O ₃	8.35	SmF ₃	6.64
Eu ₂ O ₃	7.42	EuF ₃	6.79
Gd ₂ O ₃	7.41	GdF ₃	7.06
Dy ₂ O ₃	7.81	DyF ₃	7.47
Er ₂ O ₃	8.64	ErF ₃	8.82
Yb ₂ O ₃	9.17	YbF ₃	8.17

FIG. 7

TEST CONDITION	RING BOTTOM SHIELD	BAFFLE PLATE	DEPOSITION SHIELD LOWER PORTION	SHUTTER	DEPOSITION SHIELD UPPER PORTION
1. ENTIRE $Y_2 O_3$ EXPOSED	$Y_2 O_3$	$Y_2 O_3$	$Y_2 O_3$	$Y_2 O_3$	$Y_2 O_3$
2. ENTIRELY COVERED	COVERED	COVERED	COVERED	COVERED	COVERED
3. RING BOTTOM SHIELD	$Y_2 O_3$	COVERED	COVERED	COVERED	COVERED
4. BAFFLE PLATE	$Y_2 O_3$	$Y_2 O_3$	COVERED	COVERED	COVERED
5. DEPOSITION SHIELD LOWER PORTION	$Y_2 O_3$	$Y_2 O_3$	$Y_2 O_3$	COVERED	COVERED
6. SHUTTER	$Y_2 O_3$	$Y_2 O_3$	$Y_2 O_3$	$Y_2 O_3$	COVERED
7. DEPOSITION SHIELD UPPER PORTION (SAME AS CONDITION NO.1)	$Y_2 O_3$	$Y_2 O_3$	$Y_2 O_3$	$Y_2 O_3$	$Y_2 O_3$

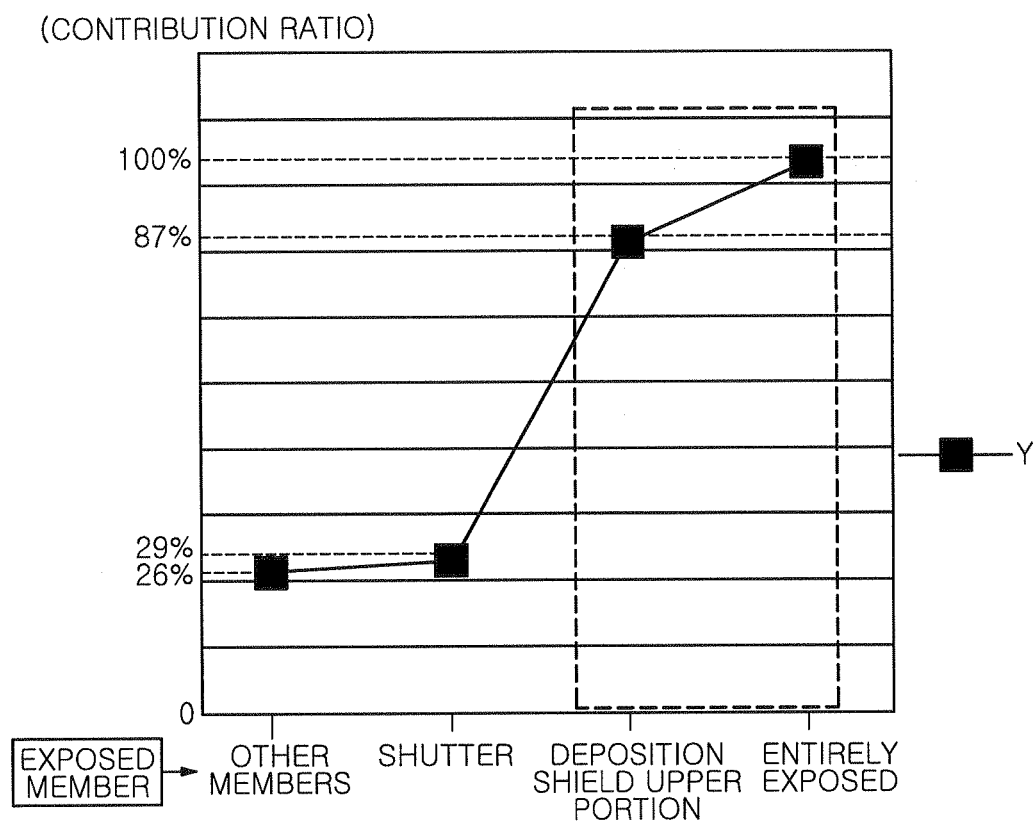
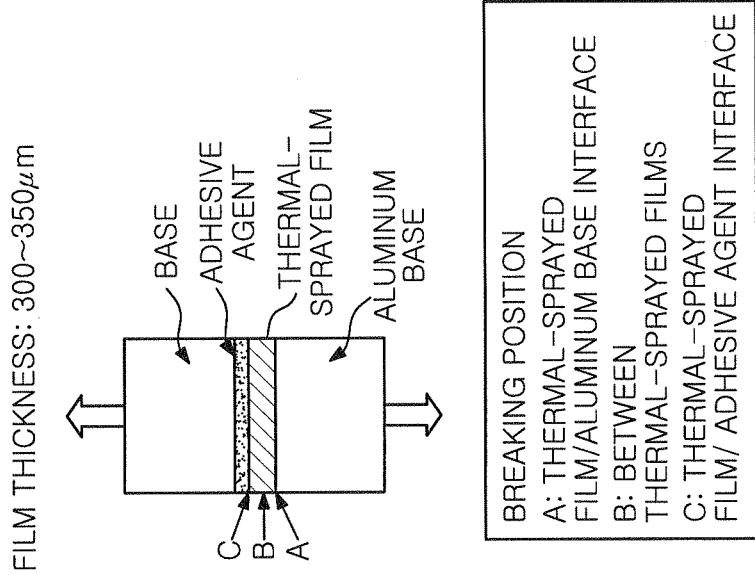
FIG. 8

FIG. 9



TPNo.	Y ₂ O ₃		YF ₃	
	BREAKING STRESS (Mpa)	BREAKING RESULT	BREAKING STRESS (Mpa)	BREAKING RESULT
1	8.7	A100%	11.3	A100%
2	7.4	A100%	11.5	A100%
3	11.2	A100%	11.4	A100%
4	10.2	A100%	8.6	A100%
5	8.0	A100%	11.0	A100%
AVERAGE	9.1		10.8	

FIG. 10

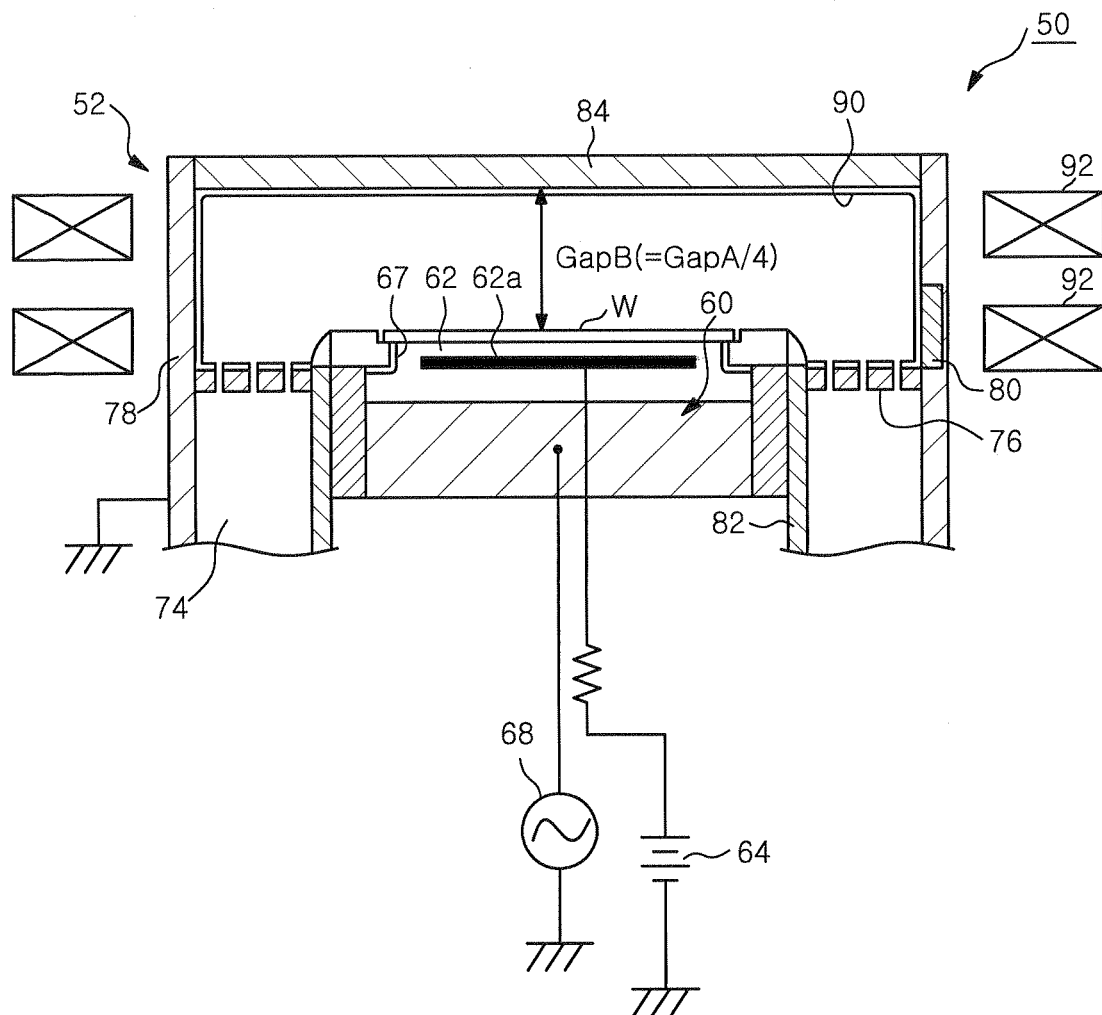


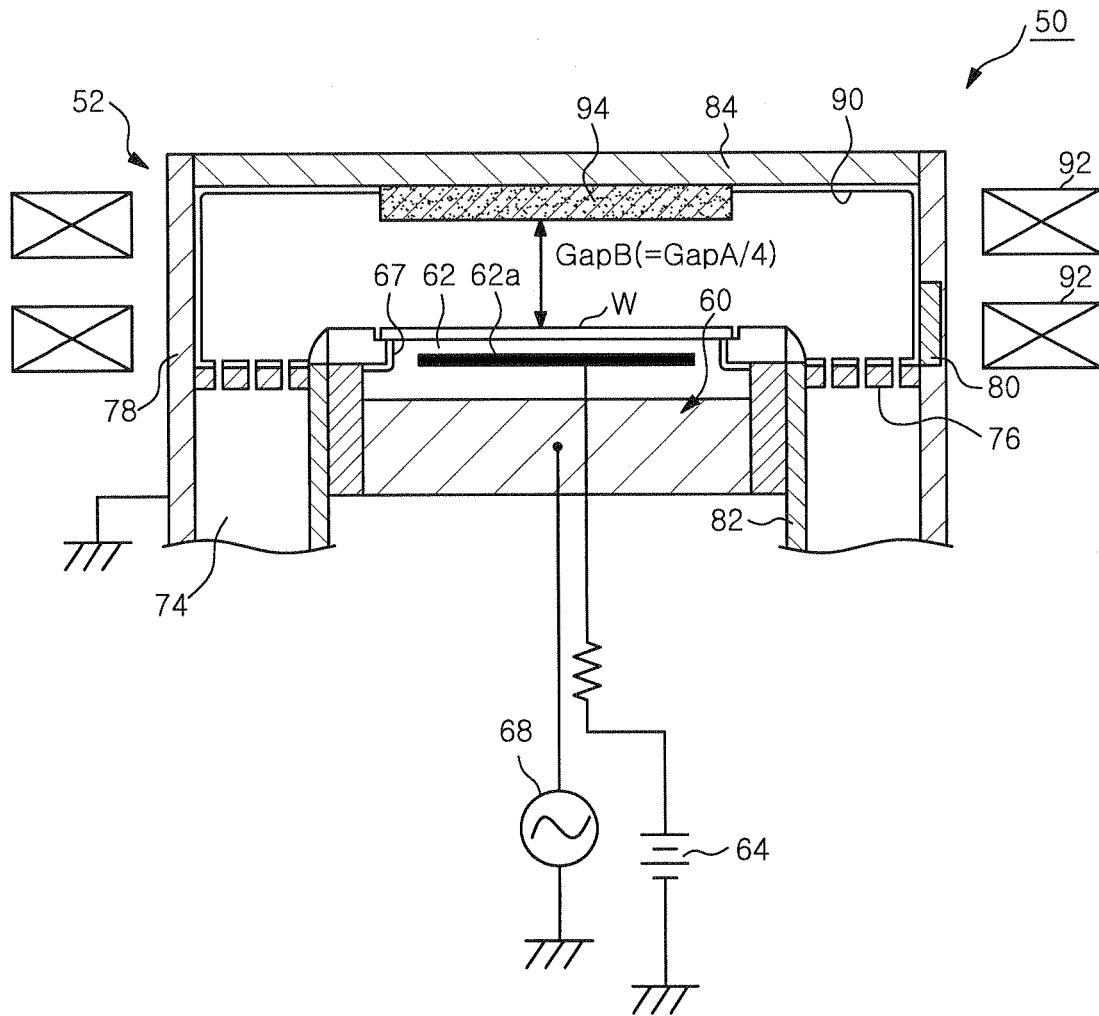
FIG. 11

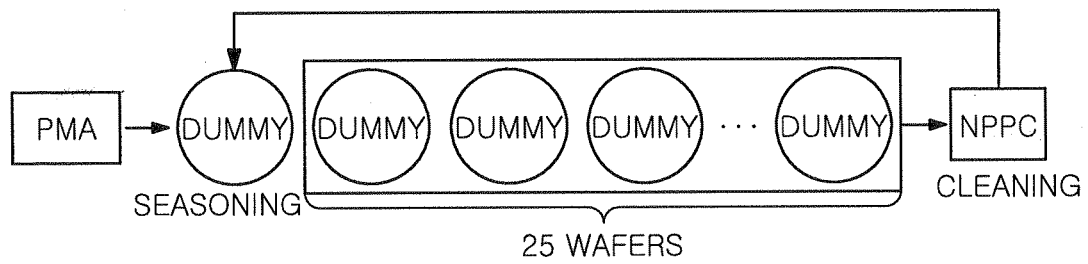
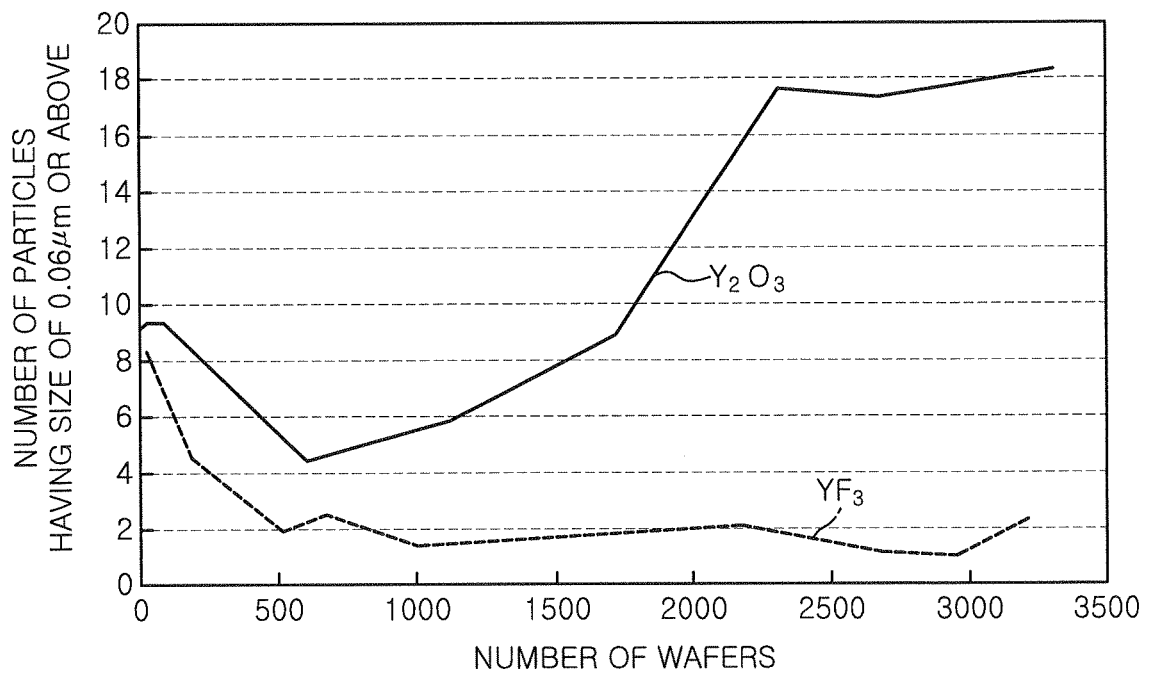
FIG. 12A*FIG. 12B*

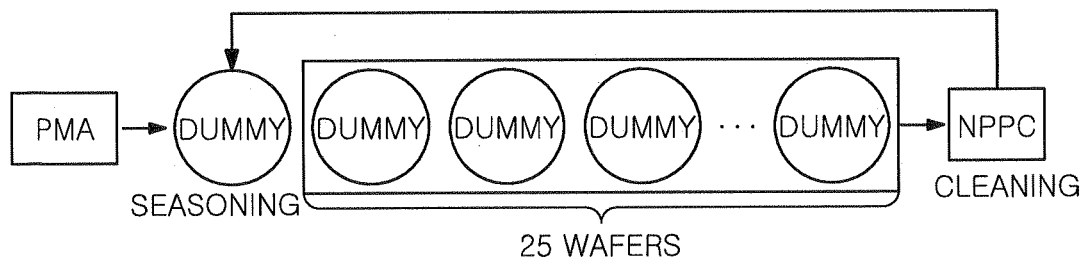
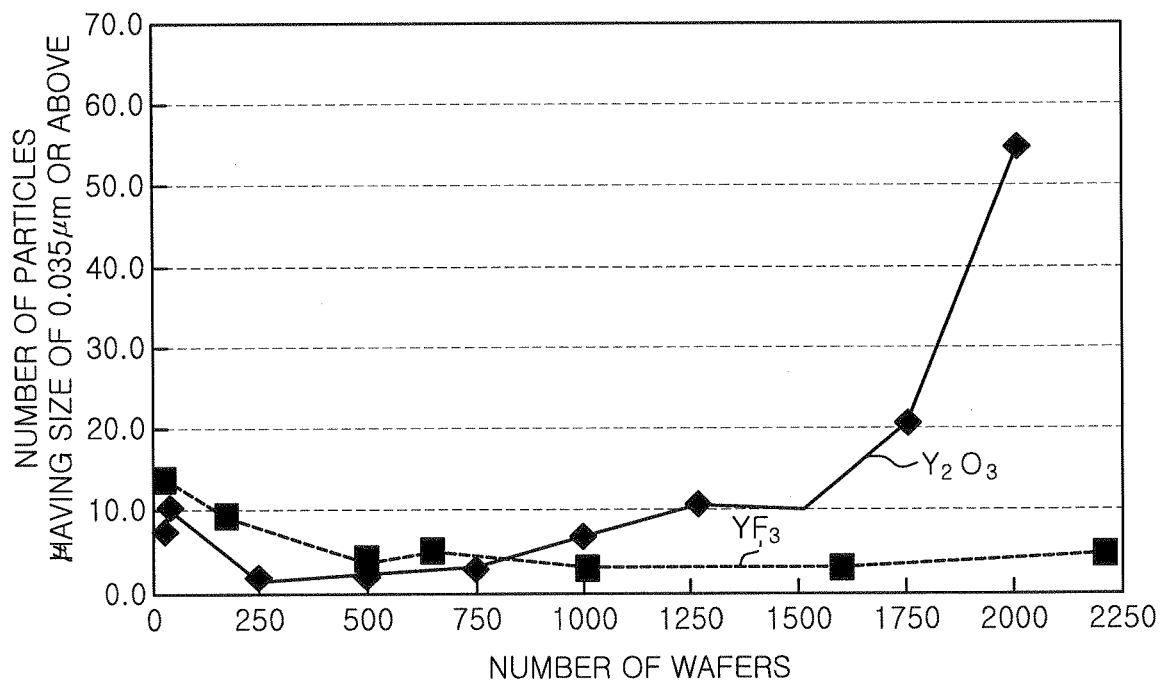
FIG. 13A*FIG. 13B*

FIG. 14

FILM MATERIAL (NUMBER OF WAFERS)	ICP-MS [E+10 atoms/cm ²]	Ave SS(0.0035 μ m up) [Particle count]	EDX		
			Y[%]	Y count	Total count
Y ₂ O ₃ (25wal)	56	10	3%	1	33
Y ₂ O ₃ (1000wal)	NA	7	23%	5	22
Y ₂ O ₃ (2000wal)	NA	55	45%	9	20
YF ₃ (25wal)	56	13	0%	0	37
YF ₃ (50wal)	63	9	0%	0	40
YF ₃ (1000wal)	70	3	0%	0	20
YF ₃ (2200wal)	82	4	10%	2	20
YF ₃ (3200wal)	NA	3	3%	1	39

FIG. 15

TEST CONDITION	SHUTTER	DEPOSITION SHIELD	BAFFLE PLATE	UPPER ELECTRODE
1. ENTIRE Y_2O_3 EXPOSED	Y_2O_3	Y_2O_3	Y_2O_3	Y_2O_3
2. ENTIRELY COVERED	COVERED	COVERED	COVERED	COVERED
3. SHUTTER	Y_2O_3	COVERED	COVERED	COVERED
4. DEPOSITION SHIELD	Y_2O_3	Y_2O_3	COVERED	COVERED
5. BAFFLE PLATE	Y_2O_3	Y_2O_3	Y_2O_3	COVERED
6. UPPER ELECTRODE (SAME AS CONDITION NO.1)	Y_2O_3	Y_2O_3	Y_2O_3	Y_2O_3

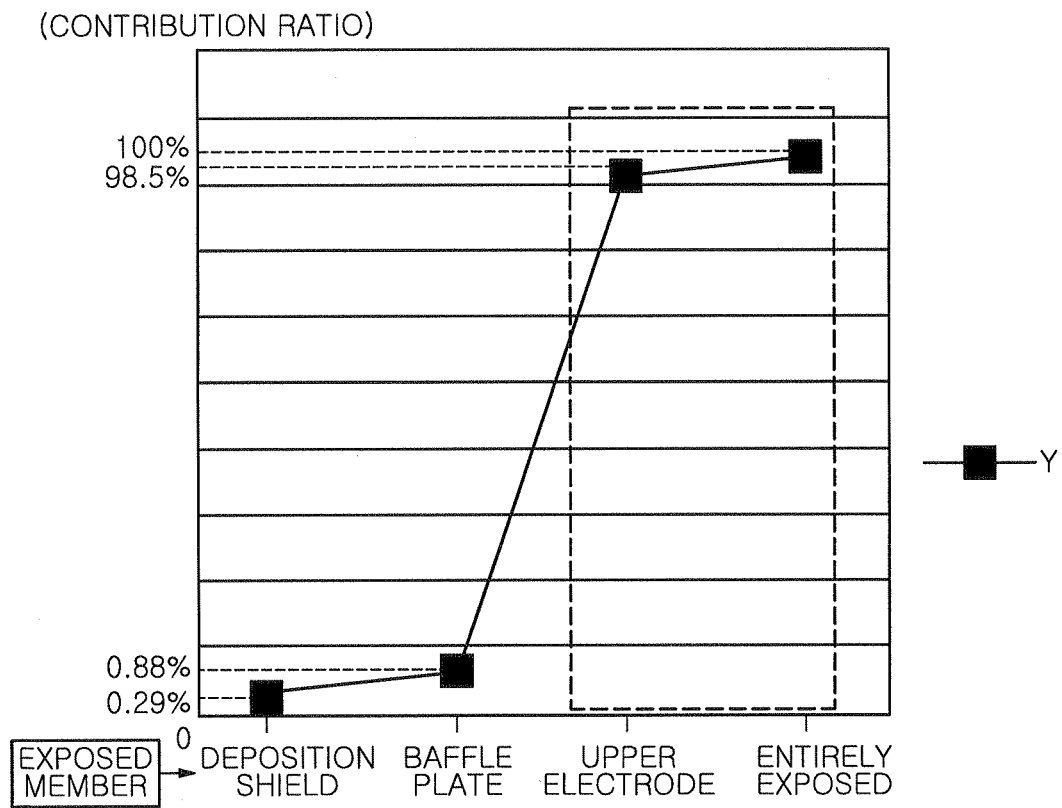
FIG. 16

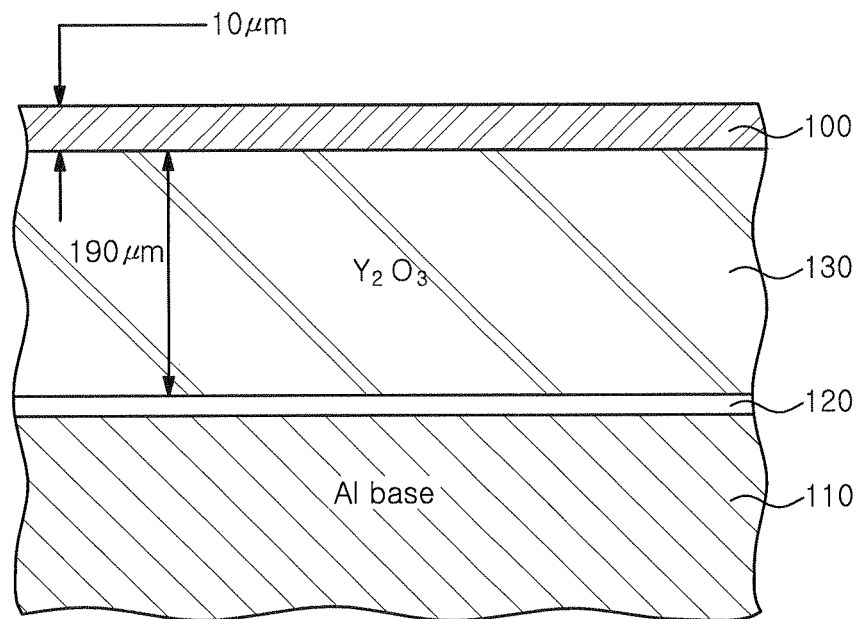
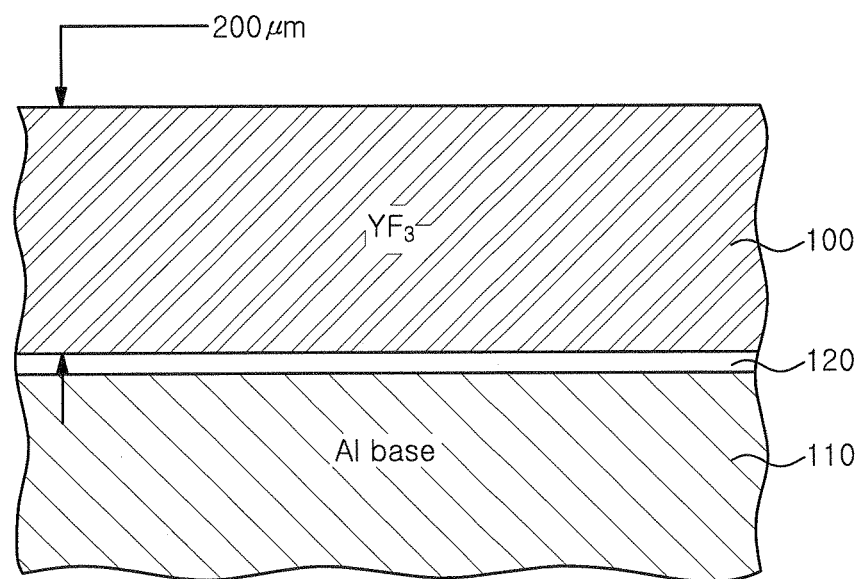
FIG. 17*FIG. 18*

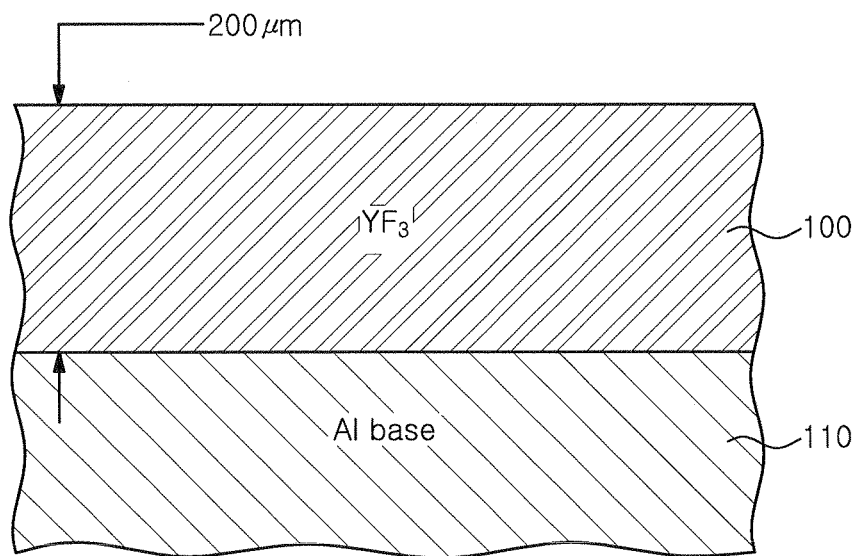
FIG. 19

FIG. 20

MATERIAL	Y_2O_3	Dy_2O_3	Gd_2O_3	Sm_2O_3	Yb_2O_3
ABRASION ($\mu\text{m/h}$)	2.7	2.0	2.4	2.8	2.0

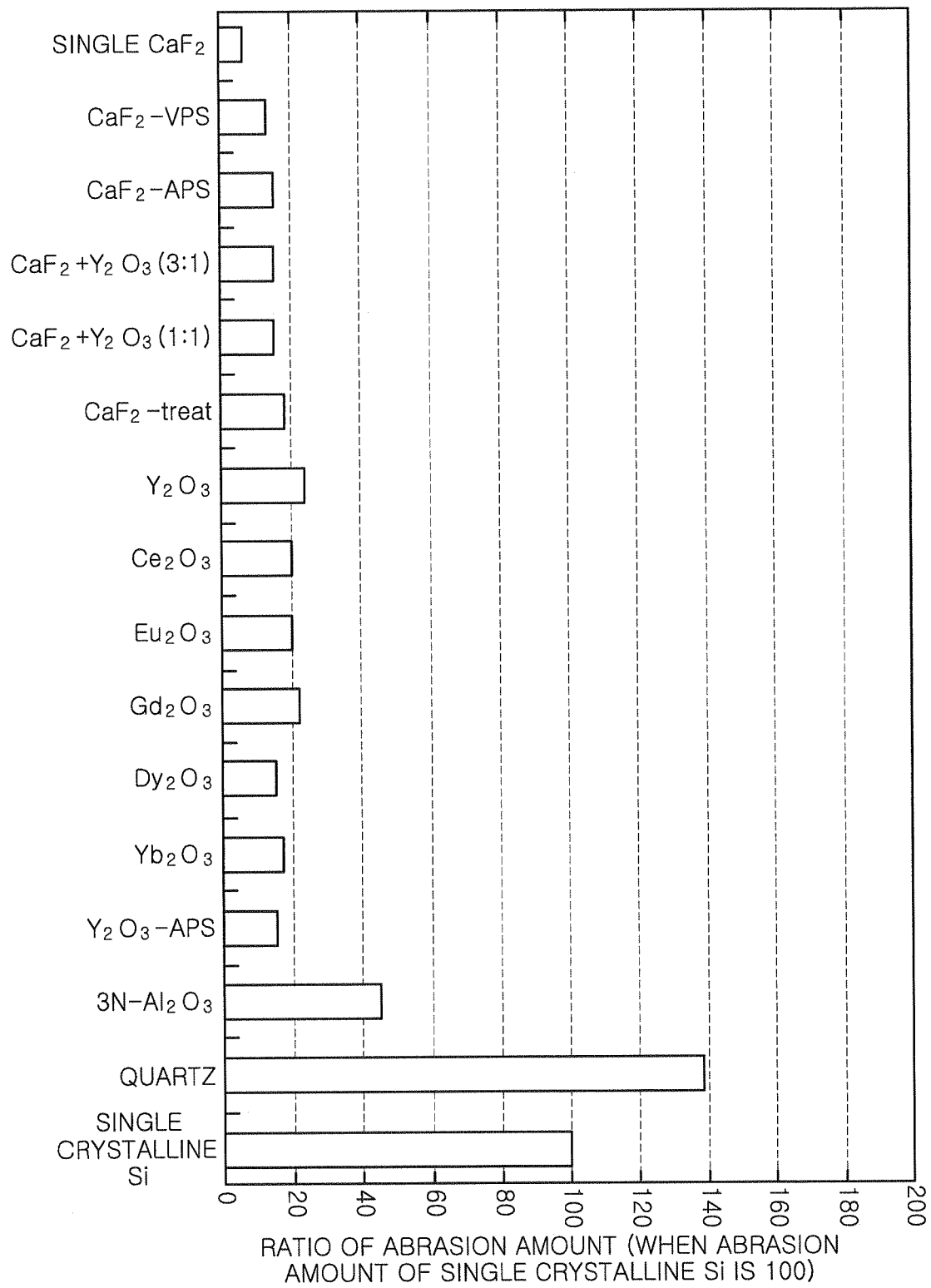
FIG. 21

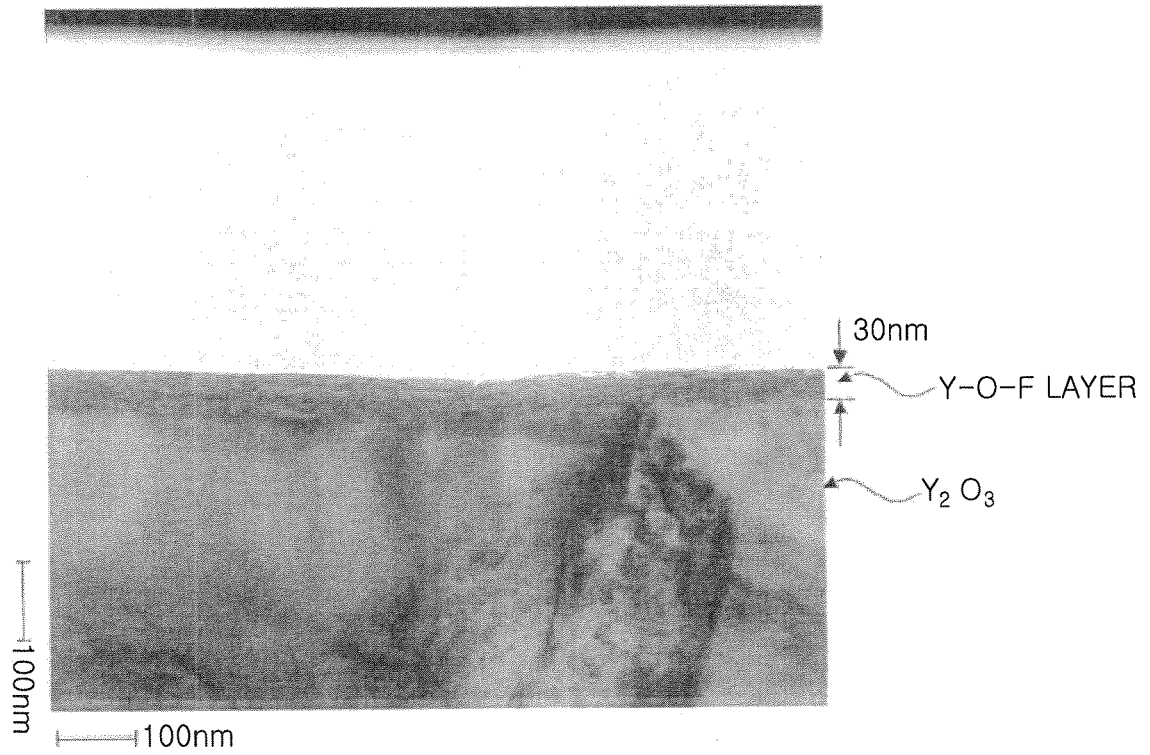
FIG. 22

FIG. 23

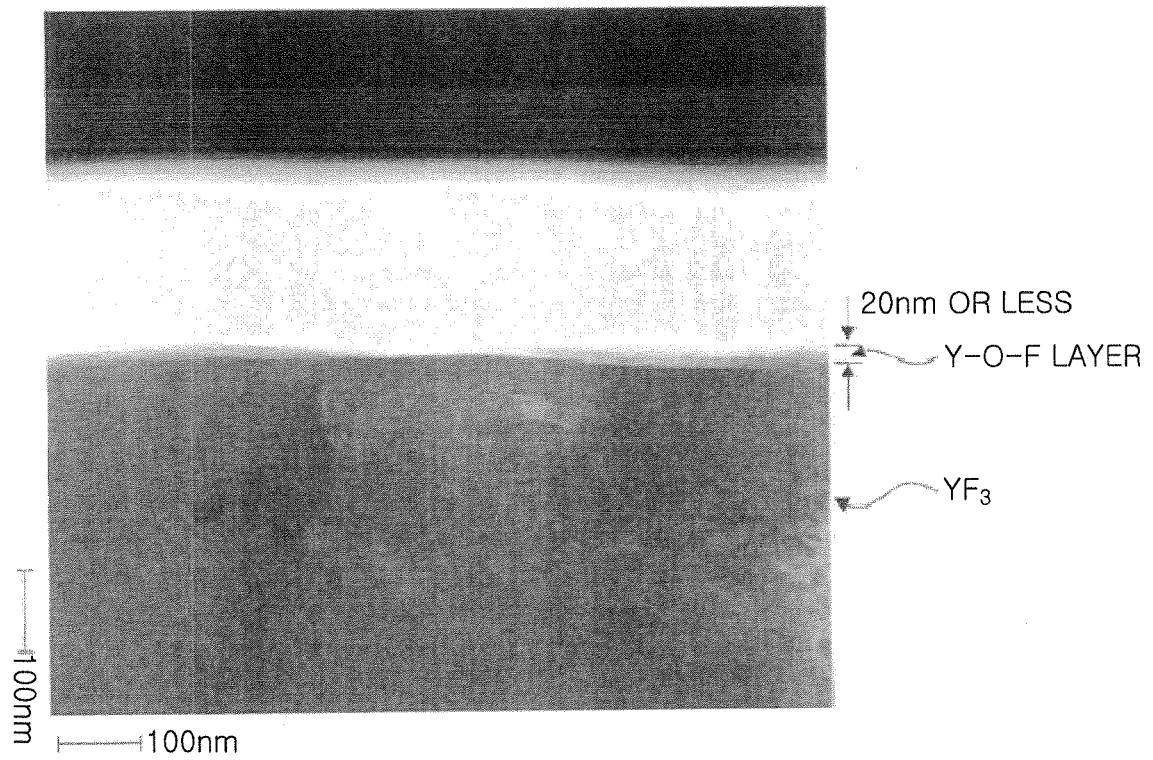


FIG. 24

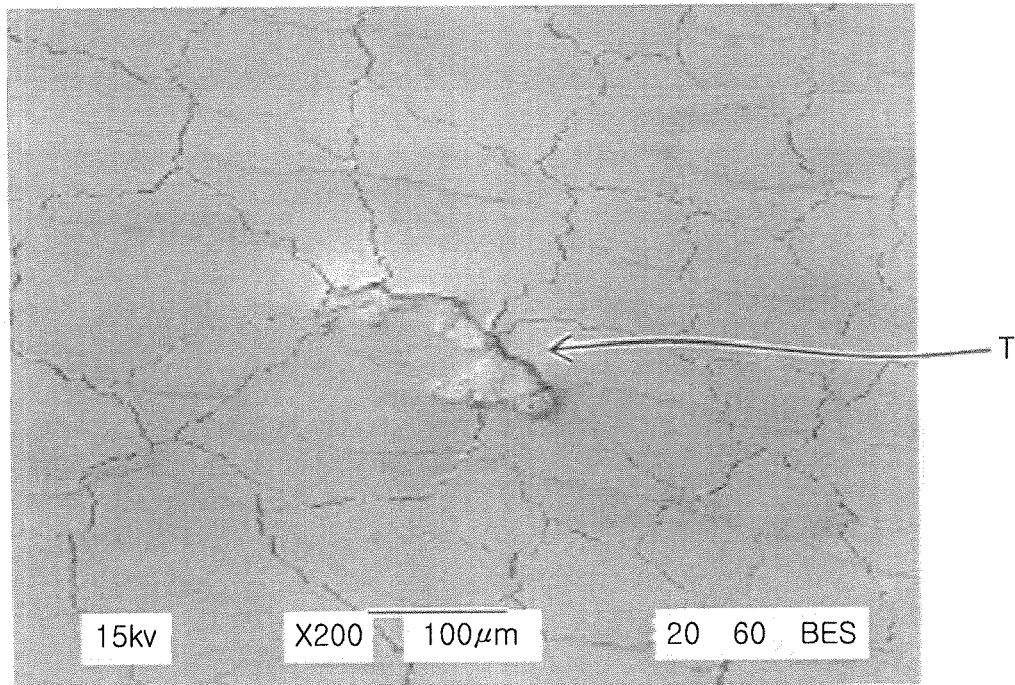


FIG. 25

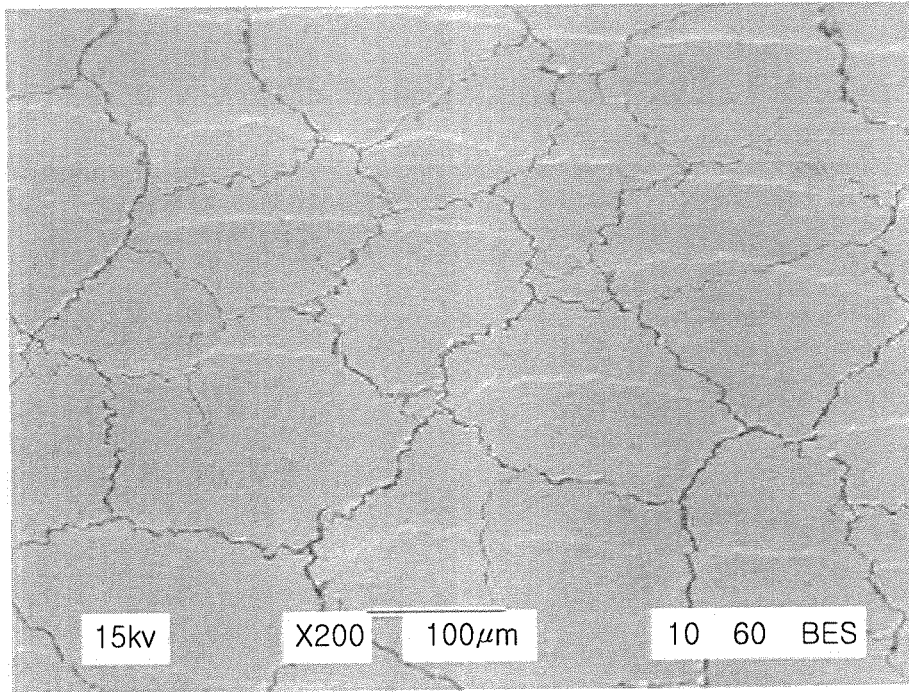


FIG. 26

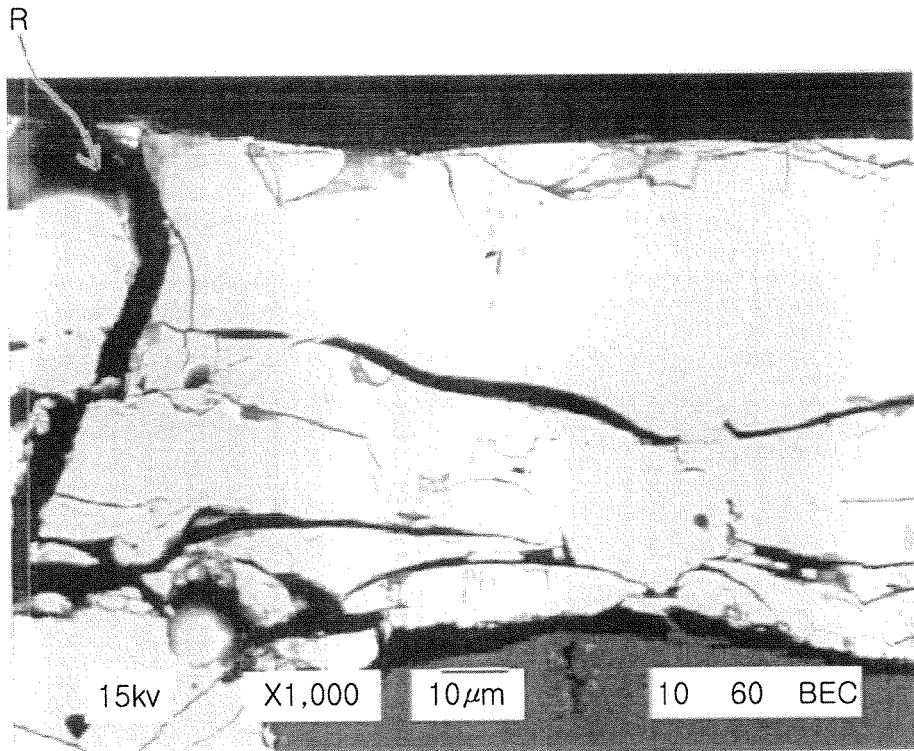


FIG. 27

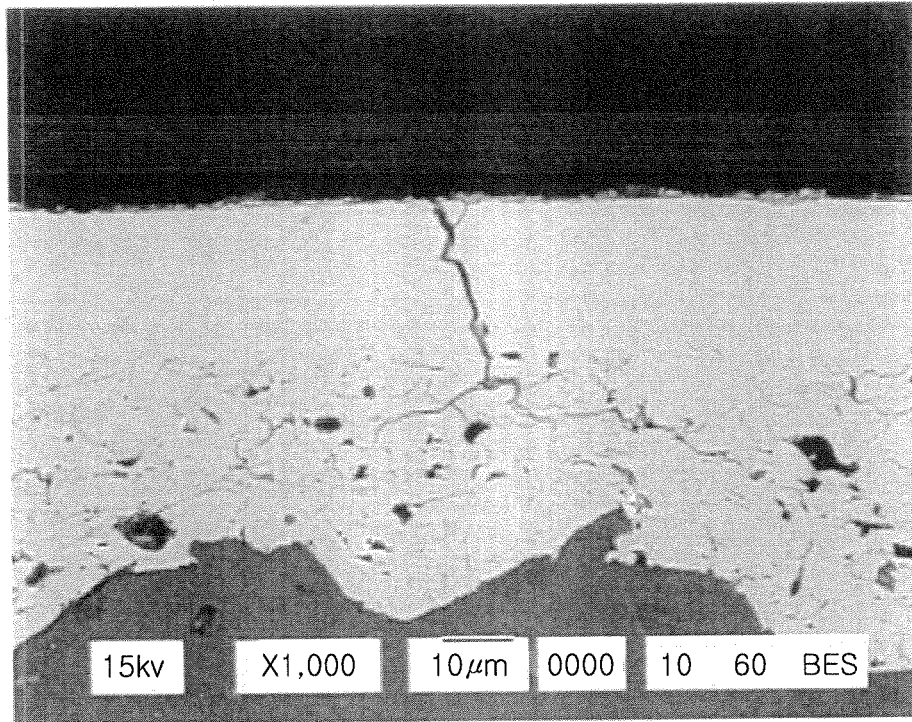


FIG. 28

POROSITY	WHITE MARKS/PEELING
3%	NO
5%	NO
7%	NO
9%	YES
12%	YES
15%	YES

FIG. 29

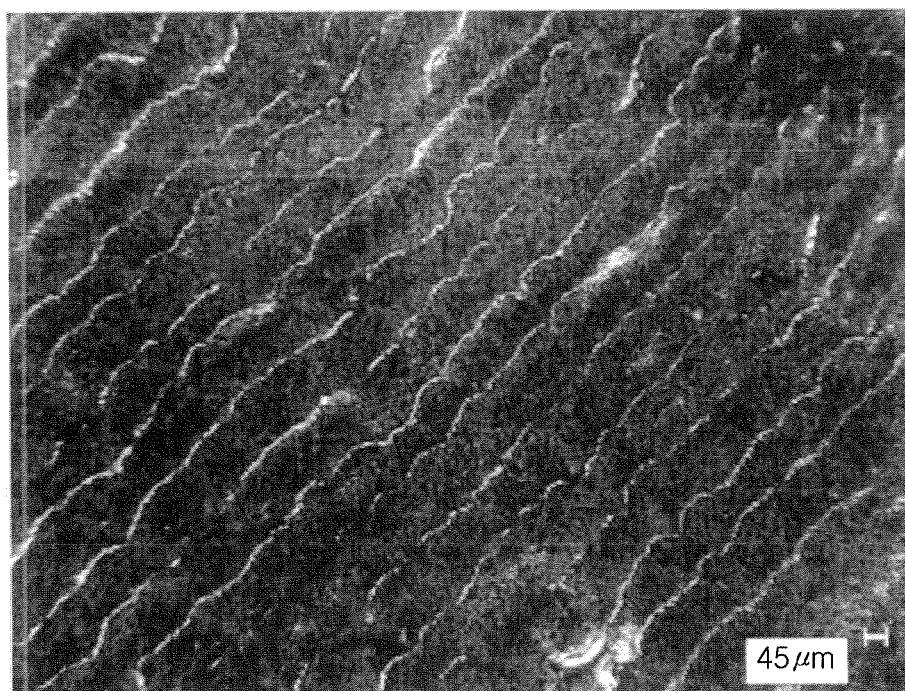


FIG. 30

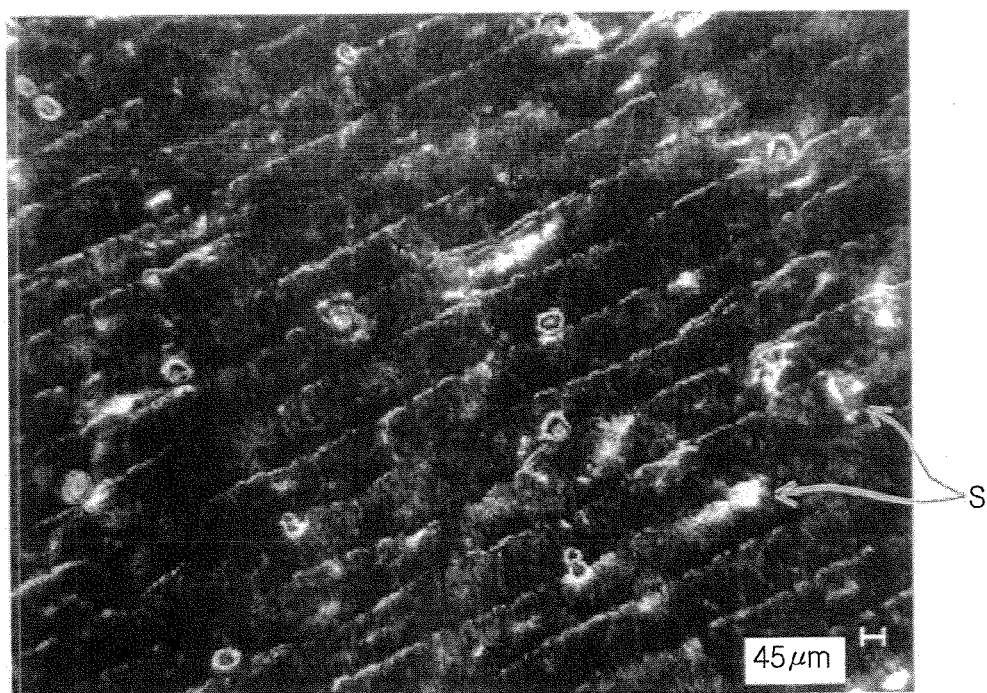


FIG. 31

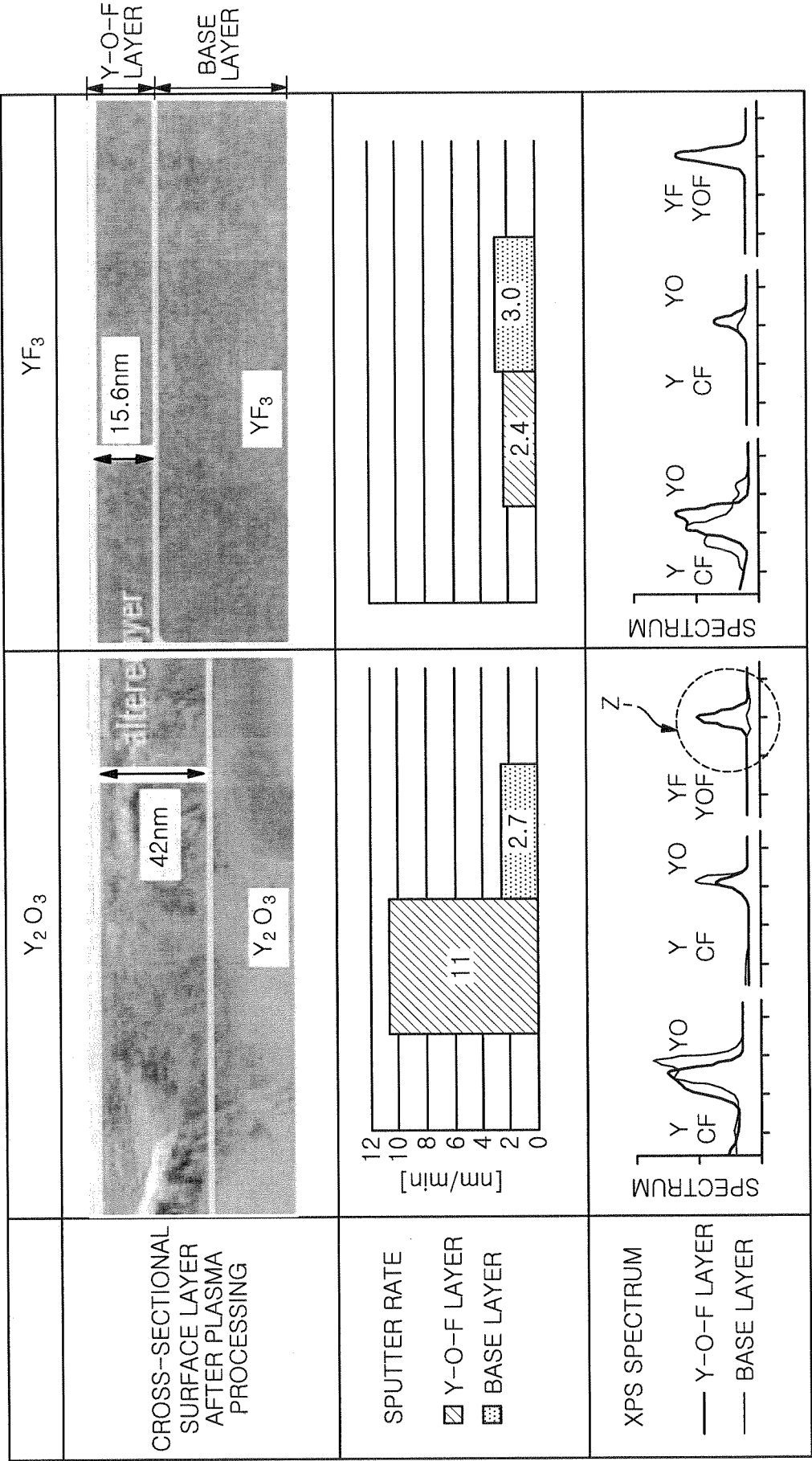


FIG. 32