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(54)

(57)

Ni/Al₂O₃, Ni/CeO₂ Ni/Al₂O₃-CeO₂ ,

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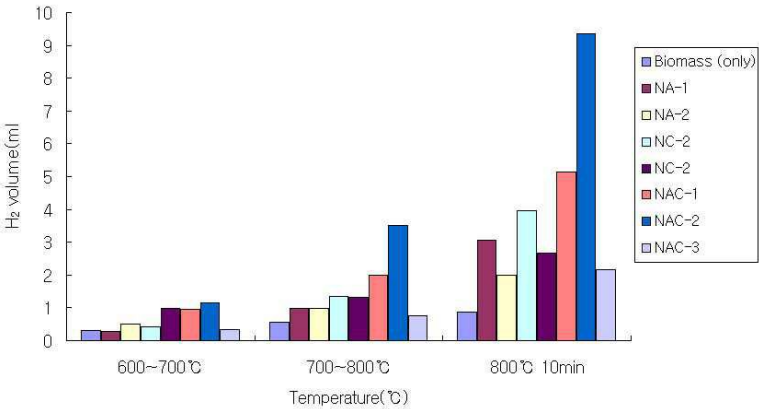
Ni/Al₂O₃, Ni/CeO₂, Ni/Al₂O₃-CeO₂

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, Ni/Al₂O₃-CeO₂

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Ni/Al₂O₃, Ni/CeO₂, Ni/Al₂O₃-CeO₂

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2

1 , Ni/Al₂O₃, Ni/CeO₂ Ni/Al₂O₃-CeO₂ 100 20 40

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3

1 , ,

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4

1 2 , Ni/Al₂O₃, Ni/CeO₂ (Nickel) 30 40 %, (Alumina) 70 60 %, (Ceria) 70 60 %

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5

1 2 , Ni/Al₂O₃-CeO₂ (Nickel) 30 40 % (Alumina)- (Ceria) 70 60 %

.

6

5 , 60:40, 50:50 60:40

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7

1 2 , Ni/Al₂O₃, Ni/CeO₂ Ni/Al₂O₃-CeO₂

.

[0001] Ni/Al₂O₃, Ni/CeO₂ Ni/Al₂O₃-CeO₂

,

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[0002]	,
[0003]	.
[0004]	10-0781503
[0005]	1 , Biomass (Tar), (H ₂ O, H ₂ , CO, CO ₂ , CH ₄)
[0006]	,
[0007]	Ni/Al ₂ O ₃ , Ni/CeO ₂ Ni/Al ₂ O ₃ -CeO ₂
[0008]	.
[0009]	Ni/Al ₂ O ₃ , Ni/CeO ₂ , Ni/Al ₂ O ₃ -CeO ₂
[0010]	, Ni/Al ₂ O ₃ , Ni/CeO ₂ , Ni/Al ₂ O ₃ -CeO ₂ 100 20 40
[0011]	, , .
[0012]	, Ni/Al ₂ O ₃ , Ni/CeO ₂ (Nickel) 30 40 %, (Alumina) 70 60 %, (Ceria) 70 60 %
[0013]	, Ni/Al ₂ O ₃ -CeO ₂ (Nickel) 30 40 % (Alumina)- (Ceria) 70 60 % , 60:40, 50:50 60:40
[0014]	, Ni/Al ₂ O ₃ , Ni/CeO ₂ Ni/Al ₂ O ₃ -CeO ₂
[0015]	, Ni/Al ₂ O ₃ , Ni/CeO ₂ , Ni/Al ₂ O ₃ -CeO ₂

Biomass

[0016] ,
[0017] ,

[0018] Ni/Al₂O₃, Ni/CeO₂, NiAl₂O₃-CeO₂
 , Ni/Al₂O₃, Ni/CeO₂, Ni/Al₂O₃-CeO₂
 100 20 ~40
 20 , 40

[0019] ,
[0020] (Nickel) 30 40 %, (Alumina) (Ceria) 70 60 %
 30~40 % 70~60 % 30 %
 40

[0021] , 30 40 % 70 60 % 900 3
(Co-precipitaion) 30~40 %
 70~60 % 30 % 40

[0022] ,
 , 30 % 70 %
 Ni/Al₂O₃-CeO₂ 800 10

[0023] < >

[0024] _____

[0025] Ni/Al₂O₃ Ni/CeO₂ 30:70 , 40:60 , Ni/Al₂O₃-CeO₂
 30:70(Al:Ce=40:60) , 30:70(Al:Ce=50:50) , 30:70(Al:Ce=60:40) (Co-
 precipitaion) 900 3 1 NA-1, NA-2, NC-1, NC-
 2, NAC-1, NAC-2, NAC-3 .

[0026] [1]

[0027]

NA-1	Ni/Al ₂ O ₃ (30:70)
NA-2	Ni/Al ₂ O ₃ (40:60)
NC-1	Ni/CeO ₂ (30:70)
NC-2	Ni/CeO ₂ (40:60)
NAC-1	Ni/Al ₂ O ₃ -CeO ₂ [30:70(Al:Ce=40:60)]
NAC-2	Ni/Al ₂ O ₃ -CeO ₂ [30:70(Al:Ce=50:50)]
NAC-3	Ni/Al ₂ O ₃ -CeO ₂ [30:70(Al:Ce=60:40)]

[0028] BET 2

EM (Scanning Electron Micrograph) 2a
2g [(A) NA-1, (B) NA-2, (C) NC-1, (D) NC-2, (E) NAC-1, (F) NAC-2, (G) NAC-3].

[2]

	NA-1	NA-2	NC-1	NC-2	NAC-1	NAC-2	NAC-3
BET Surface Area(m ² /g)	84.94	71.74	44.74	57.93	87.23	149.13	46.16
Langmuir Surface Area(m ² /g)	123.86	99.73	62.17	80.52	120.34	205.61	93.91
Average Pore Diameter (4V/A by BET)(A)	117.07	75.67	202.86	189.70	81.03	64.83	98.18
BJH A desorption Average Pore Diameter(4V/A)(A)	110.14	69.46	176.50	189.99	74.63	58.83	91.89

2, NAC-2. Al₂O₃-CeO₂
50:50.

2, SEM NA-1,2, NA-1,2 NAC-1,2,3.

(Biomass)
110 10 mm X 10 mm.
1g.

100 7 Ni/Al₂O₃, Ni/CeO₂ Ni/Al₂O₃-CeO₂ 10 % 3
, BN-1, BN-2, BN-3, BN-4, BN-5, BN-6, BN-7.

[3]

BN-1	100% Biomass + 10% NA-1
BN-2	100% Biomass + 10% NA-2
BN-3	100% Biomass + 10% NC-1
BN-4	100% Biomass + 10% NC-2
BN-5	100% Biomass + 10% NAC-1
BN-6	100% Biomass + 10% NAC-2
BN-7	100% Biomass + 10% NAC-3

(TGA)
(Nitrogen) 800 BC-1,
BC-2, BC-3 Ni/Al₂O₃, Ni/CeO₂ Ni/Al₂O₃-CeO₂
4, 3. Heating Rate 10 /min.

[4]

	(only)	BN-1	BN-2	BN-3	BN-4	BN-5	BN-6	BN-7
50	1.16	0.57	0.09	0.37	0.69	0.47	0.53	0.57

100	3.40	3.69	3.44	3.97	4.22	4.27	4.06	4.08
200	3.47	4.54	4.24	4.11	4.91	5.47	4.89	4.95
300	6.83	11.69	10.86	11.96	11.27	13.22	10.84	10.83
400	64.20	59.87	58.57	57.07	61.7	54.81	55.72	54.86
500	66.66	71.48	69.82	68.63	72.25	65.71	66.33	64.35
600	68.54	72.92	71.30	70.12	73.18	67.03	67.35	65.66
700	71.86	74.62	72.88	71.47	74.72	69.10	68.2	67.67
800	74.89	76.92	75.2	73.98	77.34	70.14	71.19	69.43

[0042] 4 3 , 40:60 % Ni/CeO₂ Biomass BN-4
.
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[0043] _____

[0044] 4
4 600~700 NC-2, NAC-1, NAC-2 2~3
, 700~800 NA-1, NA-2 1.5 , NC-1, NC-2
2 , NAC-1 3 , NAC-2 4~5 . , 800
NA-1 3 , NA-2 1.5 , NC-1 3.5 , NC-2 2.5 , NAC-1
5 , NAC-2 10 .

[0045] NAC-2
50:50

[0046] .

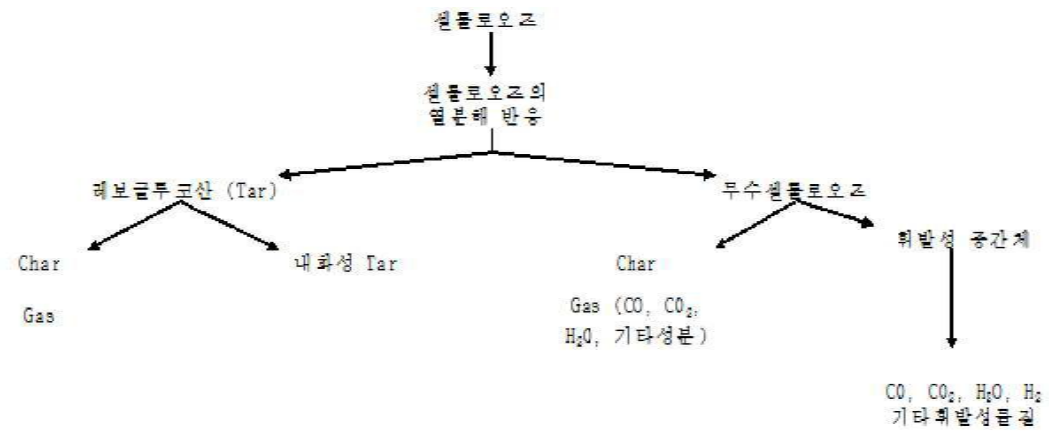
[0047] 1 Cellulose .

[0048] 2a 5g SEM (Scanning Electron Micrograph)
[(A) NA-1, (B) NA-2, (C) NC-1, (D) NC-2, (E) NAC-1, (F) NAC-2, (G) NAC-3].

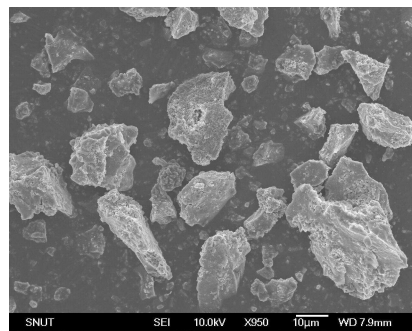
[0049] 3 .

[0050] 4 .

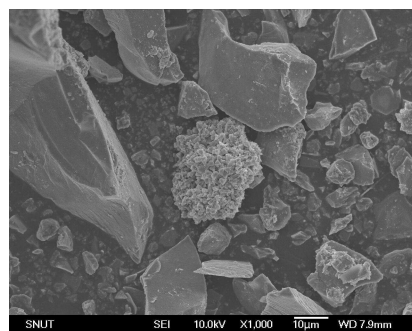
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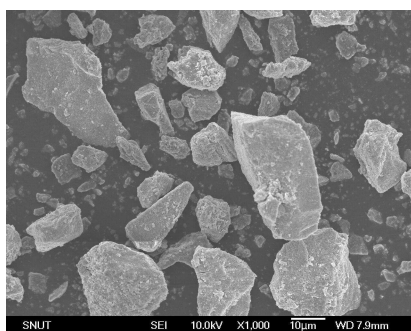
2a



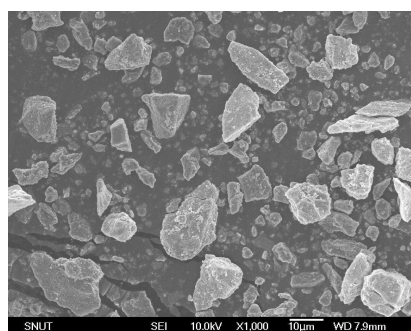
2b



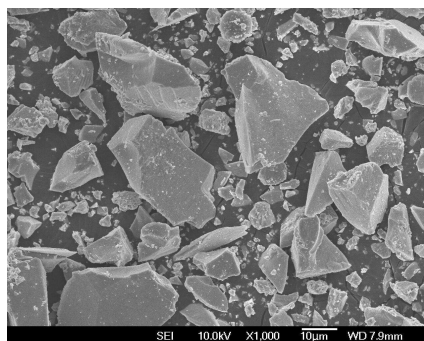
2c



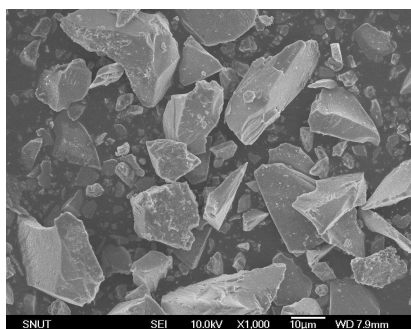
2d



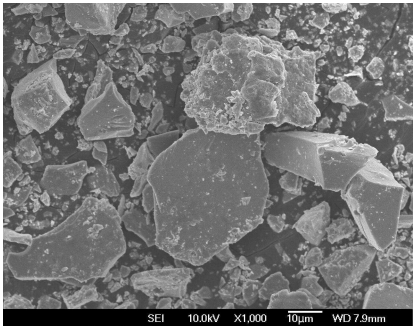
2e



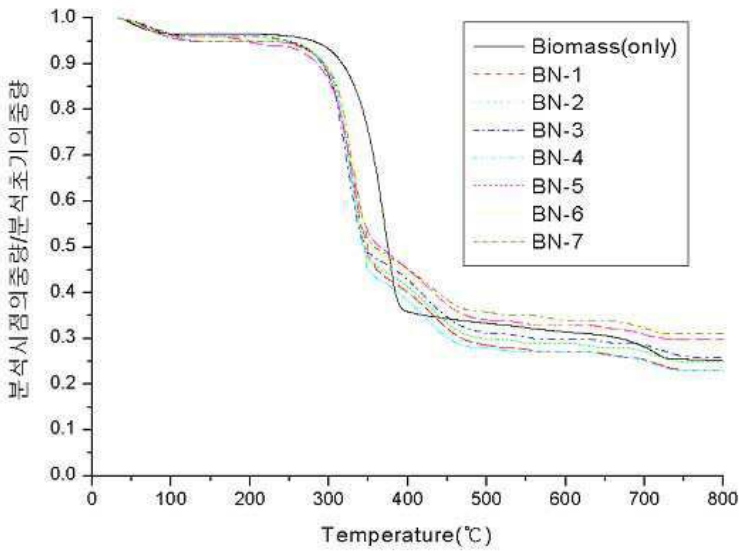
2f



2g



3



4

