Table S1 Ultimate and proximate analysis of biomass

Biomass	Type	Particle size (mm)	Ultimate analysis (wt.%)					Proximate analysis (wt.%)				LHV (kJ/kg)	Ref
			C	H	O	N	S	M	V	FC	A		
Pine sawdust	Terrestrial	0.25~0.425	49.66	5.55	43.33	0.021	1.44	8.39	84.31	6.88	0.42	18506	He[1, 2]
Pine sawdust	Terrestrial	0.25~0.425	48.80	6.38	43.74	0.05	0.04	/	84.03	14.98	0.99	/	Huang[3-9], Lin[10]
Pine sawdust	Terrestrial	0.25~0.425	48.85	6.31	44.78	0.05	0.01	8.28	84.75	6.68	0.29	19380	
Pine char	Terrestrial	<0.125	86.31	2.27	6.23	0.14	0.01	/	15.24	79.72	5.04	/	
Sewage sludge	Solid waste	/	22.06	4.16	20.63	3.18	0.75	/	46.19	4.59	49.22	/	
Pine sawdust	Terrestrial	0.3~0.45	46.44	6.21	47.29	0.05	0.01	8.39	84.31	6.88	0.42	18707	Wei[11-14]
Pine char	Terrestrial	/	85.55	2.22	11.7	0.52	0.01	/	13.66	81.33	5.01	30240	
Pine sawdust	Terrestrial	0.25~0.425	49.59	6.46	42.87	0.05	0.04	/	84.03	14.98	0.99	/	Chen[15, 16]
Sewage sludge	Solid waste	<0.18	26.05	4.29	15.7	4.12	0.67	/	46.24	4.59	49.12	/	Deng[17]
Eucalyptus wood	Terrestrial	0.18~0.25	/	/	/	/	/	/	/	/	/	/	Fan[18]
Rice husk	Terrestrial	0.45~0.6	39.74	5.23	41.31	0.52	1.34	9.84	65.07	16.13	8.96	/	Ge[19-22]
Rice straw	Terrestrial	~0.5	38.91	5.3	43.07	1.06	0.15	9.1	70.07	18.43	1.51	/	
Rice husk	Terrestrial	~1.5	40.06	5.61	39.88	0.9	0.1	11.89	75.78	14.77	1.56	14470	
Sawdust	Terrestrial	0.1~0.3	45.09	4.3	40.2	1.93	0	9.2	77.6	12.6	0.6	17750	Yan[23]
Pine char	Terrestrial	<0.25	81.92	0.82	10.96	0.3	0.44	/	10.40	84.04	5.56	/	Xue[24]
Sewage sludge	Solid waste	0.3~0.45	21.55	3.82	9.57	3.76	0.55	4.89	35.88	3.37	55.86	/	Chen[25]
Sawdust	Terrestrial	/	46.01	5.61	42.93	1.31	0.124	6.22	72.64	17.37	3.77	/	Wang[26]

Pine sawdust	Terrestrial	0.1~0.2/0.25~0.4/ 0.2~0.6	44.90	6.38	44.98	3.74	/	1.44	80.78	16.28	1.50	18330	Zeng[27-30]
Rice straw	Terrestrial	~0.5	38.91	5.30	43.07	1.06	0.15	9.59	70.07	18.43	1.91	/	Shen[31]
Rice husk	Terrestrial	/	37.66	4.81	31.97	0.42	0.023	8.06	64.92	9.96	17.06	/	Yin[32]
Pine wood	Terrestrial	0.15~0.18	49.51	6.28	42.9	/	0.36	/	84.02	0.95	15.03	18600	Liu[33]
PE	Solid waste	0.15~0.18	85.37	14.6	/	/	0.03	/	100	/	/	43920	
Pine sawdust	Terrestrial	0.3~0.6	44.25	6.36	48.85	0.48	0.06	9.5	75.65	13.83	1.02	17140	Guo[34], Zhao[35], Niu[36, 37]
Pine sawdust	Terrestrial	0.1~0.15	47.16	6.21	45.22	0.17	0.15	6.9	77.96	14.05	1.09	/	Jin[38]
Pine sawdust	Terrestrial	/	48.5	6.4	44.9	0.1	0.1	3.4	80.2	16.2	0.2	/	Wang[39, 40]
Chlorella vulgaris	Aquatic	<0.2	45.49	6.61	28.69	10.28	0.21	/	78.98	12.30	8.72	18692	Liu[41-46]
Chlorella vulgaris	Aquatic	<0.2/<0.18	49.99	7.39	27.40	9.48	0.5	/	81.84	12.91	5.25	19576	
Pine sawdust	Terrestrial	<0.2	45.14	6.17	45.48	2.04	0.1	/	82.41	16.52	1.07	16289	
Rice straw	Terrestrial	<0.18	40.4	6.3	35.6	1.1	0.1	/	71.9	11.6	16.5	/	Liao[47]
Rice straw	Terrestrial	<0.18	39.7	6.01	43.01	0.95	0.24	/	73.44	16.47	10.09	14986	Wu[48, 49]
Rice straw	Terrestrial	<0.2	42.48	6.24	42.56	0.55	0.03	/	76.32	15.54	8.14	17500	Chen[50]
Rice straw	Terrestrial	<1	43.08	6.63	38.56	0.65	0.21	/	76.84	12.30	10.86	/	Hu[51]
Chlorella vulgaris	Aquatic	<0.2	53.32	7.14	27.87	10.04	1.63	6.54	51.75	32.10	9.61	/	Hu[52, 53]
Wheat straw	Terrestrial	<0.15	47.3	6.3	45.1	1.3	0.11	7.6	66.6	16.2	9.7	/	Hu[54-56]
Rice straw	Terrestrial	<0.18	36.17	5.63	37.98	0.61	0.23	7.64	64.67	16.91	10.78	/	

Corn stalk	Terrestrial	<0.15	48.8	5.78	36.4	0.92	0.12	8.34	67.1	17.1	7.46	/	
Peanut shell	Terrestrial	<0.15	48.4	6.7	38.1	1.37	0.1	7.88	68.1	21.4	2.6	/	
Rice husk	Terrestrial	<0.2	40.78	5.58	52.41	0.82	0.42	8.43	65.53	13.71	12.33	13840	Huang[57]
Coffee grounds	Terrestrial	0.25~0.425	52.61	6.89	33.92	1.74	0.64	3.18	79.6	16.2	1.02	21260	Zhang[58]
Waste activated carbon (WAC)	Solid waste	0.08~0.2	46.62	6.25	45.66	0.83	0.64	9.65	57.20	30.02	3.13	15500	Wang[59]
Kitchen waste (KW)	Solid waste	0.09~0.212	38.85	7.33	38.13	1.49	0.58	10.37	72.02	14.36	3.25	14690	Wang[60]

Table S2 main elements of OC

OC	Particle (mm)	Elements composition	Ref
Hematite	0.18~0.25	81.66% Fe_2O_3, 5.64% SiO_2, 0.88% Al_2O_3, 0.24% CaO, 0.031% S	He[1, 2]
Spinel	/	$NiFe_2O_4$	Huang[3-9], Lin[10]
Hematite	0.18~0.25	81.66% Fe_2O_3, 5.64% SiO_2, 0.88% Al_2O_3, 0.24% CaO, 0.031% S	
Hematite-NiO	/	Hematite: 89.53% Fe_2O_3, 6.78% SiO_2, 1.28% Al_2O_3, 0.13% CaO, 0.024% S NiO/Hematite=1, 6, 10%	
Hematite	0.18~0.25	90.73% Fe_2O_3, 6.78% SiO_2, 1.28% Al_2O_3, 0.13% CaO, 0.024% S	
Hematite	/	89.53% Fe_2O_3, 6.78% SiO_2, 1.28% Al_2O_3, 0.13% CaO, 0.024% S	
Spinel	<0.125	$NiFe_2O_4$	
Hematite	/	88.56% Fe_2O_3, 6.48% SiO_2, 3.73% Al_2O_3, 0.22% CaO, 0.019% S	

Cu/Al/Zn	/	27.91%O, 22.56%Zn, 21.52%Cu, 13.56%Na, 13.4%Al, 0.937%Ni	
Cu/Al/Ni	/	23.59%O, 0.028%Zn, 30.27%Cu, 8.64%Na, 11.66%Al, 33.72%Ni	
Cu/Al/Ni/Zn	/	26.22%O, 18.29%Zn, 17.06%Cu, 7.37%Na, 9.97%Al, 20.71%Ni	Wei[11-14]
Fe_2O_3-Al_2O_3	0.18~0.25	70%Fe_2O_3, 30%Al_2O_3	
Fe-Ni-Al	/	66.48%Fe2O3, 28.49%Al_2O_3, 5.03%NiO	
MFe_2O_4 M=Cu/Ba/Ni/Co	/	$CuFe_2O_4$/$BaFe_2O_4$/$NiFe_2O_4$/$CoFe_2O_4$	Chen[15, 16]
Copper slag	<0.15	39.62%Fe, 31.89%O, 13%Si, 2.21%Ca, 2.19%Zn, 1.84%Al, 1.36Mg, 0.75%S, 0.66%Cu	Deng[17]
Fe/La-Fe/Ni-Fe/Co-Fe/Mn-Fe/Ca-Fe	/	Iron ore, $LaFeO_3$, $NiFe_2O_4$, $CoFe_2O_4$, $MnFe_2O_4$, $CaFe_2O_4$	Fan[18]
Hematite	0.3~0.45	83.21%Fe_2O_3, 5.37%Al_2O_3, 7.06%SiO_2, 4.6%Others	Ge[19-22]
NiO-Al_2O_3	0.3~0.45	60%NiO, 40%Al_2O_3	Chen[25]
$BaFe_2O_4$-Al_2O_3	0.1~0.3	70%$BaFe_2O_4$, 30%Al_2O_3	Yan[23]
Manganese ore	0.3~0.45	20.04%Mn, 15.3%Fe, 16.95%Si, 4.84%Al, 0.97%K, 0.35%Mg, 0.15%Ti	Wang[26]
Fe/Ca	<0.25	Fe_2O_3, 50%Fe_2O_3-50%CaO, $CaFe_2O_4$	Xue[24]
Fe_2O_3	0.1~0.3	99.99%Fe_2O_3	
Hematite	0.1~0.3	89.15%Fe_2O_3, 6.43%SiO_2, 3.15%Al_2O_3	Zeng[27-30]
Red mud	0.1~0.3	31.40%Fe2O3, 16.1% SiO2, 31.3%Al_2O_3, 5.45%CaO, 6.58%TiO_2, 6.65%Na_2O	
Hematite	/	90.75%Fe_2O_3, 1.14%Fe_3O_4, 0.88%Al_2O_3, 4.18%SiO_2	
Fe_2O_3-CuO-CAC	0.3~0.45	60~0%Fe_2O_3, 0~60%CuO, 40%CAC CAC=51.08%Al2O3, 33.12%CaO, 7.80%SiO_2,	Shen[31]
Manganese ore	/	15.3%Fe, 20.04%Mn, 4.84%Al, 16.95%Si, 0.15%Ti, 0.97%K, 0.35%Mg, 41.6%O	Yin[32]
Fe_2O_3	<0.18	Fe_2O_3/CaO=0~1.5	Liu[33]

Copper ore	0.1~0.3	CuO, $CuFe_2O_4$	Guo[34]
Hematite	0.1~0.3	Fe_2O_3, Al_2O_3, SiO_2	
CuO-$CuAl_2O_4$	0.2~0.3	60%CuO, 40%$CuAl_2O_4$	Zhao[35]
Fe_2O_3-Al_2O_3	0.2~0.3	60%Fe_2O_3, 40%Al_2O_3	
Copper ore	0.2~0.3	21.04%CuO, 70.05%$CuFe_2O_4$, 8.91%(SiO_2+$CaSO_4$+Al_2O_3)	
Cu-Fe oxides	0.1~0.3	CuO/Fe_2O_3=100/0~0/100	Niu[36, 37]
Hematite	0.15~0.18	90.01%Fe_2O_3, 3.86%SiO_2, 1.8%Al_2O_3, 3.06%MgO, 1.18%CaO	Jin[38]
$CoFe_2O_4$	/	$CoFe_2O_4$	Wang[39, 40]
Fe_2O_3	<0.2	Fe_2O_3	Liu[41-46]
Calcium ferrites	/	$Ca_2Fe_2O_5/CaFe_2O_4$	
$Ca_2Fe_{2-x}Co_xO_5$	/	$Ca_2Fe_{2-x}Co_xO_5$(x=0~1.4)	
Fe_2O_3-CaO	<0.2	CaO/Fe_2O_3=1/0.2	
$Ca_2Fe_2O_5$ (Mg/Al/Zn)	/	$Ca_2Fe_2O_5$(ZnO/MgO/Al_2O_3)	
$Ca_{2-x}Sr_xFe_2O_5$	/	$Ca_{2-x}Sr_xFe_2O_5$(x=0~1.8)	
Fe_2O_3(K-doped)	/	Fe_2O_3/K_2CO_3=14:1, 7:1	Liao[47]
Fe_2O_3-CaO	/	CaO/Fe_2O_3=1/0.2	Wu[48, 49]
Fe_2O_3	<0.18	Fe_2O_3	
Mn-Fe-Al_2O_3	<0.2	Mn/Fe=1/2, Mn-Fe/Al_2O_3=100/0~50/50	Chen[50]
Fe-Ca	0.09~0.212	Fe:Ca=1:2, 1:1, 2:1	Hu[51]
Fe_2O_3	/	Fe_2O_3	Hu[52, 53]
Fe-Si-Al	<0.2	Fe_2O_3, SiO_2, Al_2O_3	Huang[57]
Fe_2O_3-Inert support	0.3~0.425	Fe_2O_3(Al_2O_3, TiO_2, SiO_2, ZrO_2)	Hu[54-56]

Fe_2O_3-ATP-K	0.098~0.18	$[Fe(CN_2H_4O)_6](NO_3)_3$/ATP=4/6 $[Fe(CN_2H_4O)_6](NO_3)_3$/ATP/KNO_3=4/6/1	Zhang[58]
Fe_2O_3-ATP-Al_2O_3	0.08~0.2	Fe_2O_3/ATP=4:6 Fe_2O_3/Al_2O_3=4:6	Wang[59]
$CuFe_2O_4$-ATP	0.09~0.212	$CuFe_2O_4$/ATP	Wang[60]

TableS3 A brief summary of experimental result of CLG.

OC	Biomass	OC/B[a]	Reactor	Tem (°C)	R_t[b] (min)	H_2O[c]	LHV (MJ/m^3)	η_c (%)	η (%)	Ref
Hematite	Pine	150/40	Bubbling	650~900	30	/	12.5~12.8	60~96	46~78	He[1, 2]
Hematite	Pine	150g/ 0.1kg/h	Bubbling	800	50	0.35~1.35	11.4~13.1	81~97	69~80	
Hematite	Pine	150g/ 0.1kg/h	Bubbling	700~850	50	0.85	12.1~13.0	92~97	78~81	
Hematite	Pine	1.12~2.56	Bubbling	840	50	/	13.1~14.3	68~85	67~76	
Hematite	Pine	1.5	Bubbling	740~940	50	/	13.5~13.8	75~85	69~84	
Hematite-NiO	Pine char	0.75/0.5	Fixed	1200	15	/	/	55.56	/	Huang[3-9], Lin[10]
Hematite	Pine char	2~5/0.45	Fixed	850	65	/	/	21~44	/	
Hematite	Pine char	3/0.45	Fixed	850	65	0.02~0.1ml/min	/	56~64		
$NiFe_2O_4$	Pine char	1/0.55	Fixed	850	100	0.02~0.1ml/min	/	71~88	/	
Hematite	Sewage sludge	1~5/1	Fixed	900	60	/	7.4~11.5	67~81	/	
Hematite	Sewage	3/1	Fixed	800~950	60	/	8.4~9.5	62~85	/	

	sludge									
Hematite	Sewage sludge	3/1	Fixed	900	60	0.006~0.05ml/min	9.1~9.3	75~88	/	
$NiFe_2O_4$-ZrO_2	Pine	0.51/1	Fixed	700~900	65	/	12.1~13	47~74	/	
$NiFe_2O_4$-ZrO_2	Pine	0~1.2/1	Fixed	850	65	/	7.3~16.2	54~78	/	
$NiFe_2O_4$-ZrO_2	Pine	0.51/1	Fixed	850	65	0~3	11~13	71~92	/	
$NiFe_2O_4$-ZrO_2	Pine	0.51/1	Fixed	850	65	1.5 (CO_2/H_2O =0.11~0.56)/	4.9~11.3	68~94	/	
Fe_2O_3-Al_2O_3	Pine	5.8kg/ 1.2kg/h	Circulating (10kW)	670~900	3600	/	9.3~12.2	84~94	42~61	
Fe_2O_3-Al_2O_3	Pine	5.8kg/ 0.7~3.7kg/h	Circulating (10kW)	850	3600	/	7.1~13.5	69~98	43~70	
Fe_2O_3-NiO-Al_2O_3	Pine	5.2kg/ 1.2kg/h	Circulating (10kW)	760~910	3600	/	12.3~13.3	84~95	64~85	
Fe_2O_3-NiO-Al_2O_3	Pine	5.2kg/ 0.8~3.7kg/h	Circulating (10kW)	850	3600	/	9.8~13.5	71~98	62~70	Wei[11-14]
Cu-Al-Zn	Pine	1/1	Fixed	850	32	/	11.9	80.2	69.5	
Cu-Al-Ni	Pine	1/1	Fixed	850	32	/	11.9	82.2	60.4	
Cu-Al-Ni-Zn	Pine	1/1	Fixed	850	32	/	11.9	82.0	71.3	

Fe-Al	Pine	1/1	Fixed	850	32	/	12.7	78.5	54.3	
Fe-Ni-Al	Pine char	1/1	Fixed	850	55	/	/	36.65	/	
MFe_2O_4 M=Cu/Ba/Ni/Co	Pine	2/1	Fixed	850	60	0.1ml/min	/	/	/	Chen[15,16]
$BaFe_2O_4$	Pine	0.2/2	Fixed	750~900	60	0.02~0.14ml/min	/	/	/	
Copper Slag	Sewage sludge	0~10/1	Fixed	900	60	/	10.7~19.4	51~73	/	Deng[17]
Copper Slag	Sewage sludge	1/1	Fixed	900	60	0~0.05ml/min	12.4~13.9	70~80	/	
Iron ore	Eucalyptus wood	1/1	Fixed	850	/	/	14.43	58	/	Fan[18]
$MnFe_2O_4$							13.42	65		
$LaFeO_3$							14.29	60		
$CoFe_2O_4$							11.39	65		
$NiFe_2O_4$							11.72	68		
$CaFe_2O_4$							13.00	74		
Iron ore	Rice husk	79.2/5	Bubbling	750~900	100	0.6ml/min	/	58~71	/	Ge[19-22]
$NiO-Al_2O_3$	Rice straw	/	Circulating (25kW)	650~850	/	1.2	/	90~95	/	
Hematite	Rice husk	/	Circulating (25kW)	800~900	/	1	/	90~99	/	
$BaFe_2O_4-Al_2O_3$	Sawdust	0.2~1	Bubbling	25~90	/	/	/	50~65		Yan[23]
Hematite	Sewage sludge	0~42.6/2	Bubbling	900	20	0.75L/min	/	62~79	/	Chen[25]

Hematite	Sewage sludge	30/2	Bubbling	750~900	20	0.75L/min	/	48~79	/	
Hematite	Sewage sludge	30/2	Bubbling	900	20	0~0.75L/min	/	67~79	/	
Manganese ore	Sawdust	/ 0.2~1.2	Bubbling	750~950 900	/	/	/	47~64 59~62		Wang[26]
Hematite	Pine	0.05~0.2/0.2	Fixed	800	10	/	8.8~10.9	/	/	
Fe_2O_3	Pine	0.6/1	Fixed	Program	100	/	~7.3	/	/	
Hematite	Pine	0.67/1	Fixed	Program	100	/	~6.9	/	/	
Red mud	Pine	1.91/1	Fixed	Program	100	/	~7.8	/	/	
Hematite	Pine	4kg/0.12kg/h	Circulating	700~880/ 910	30	1.5	/	/	71~77	Zeng[27-30]
Hematite	Pine	4kg/0.12kg/h	Circulating	820/ 700~970	30	1.5	/	/	75~82	
Hematite	Pine	4kg/0.12kg/h	Circulating	820/910	30	0.5~3	/	/	69~77	
Fe_2O_3-CuO-CAC	Rice straw	40(Fe-Cu)/5	Bubbling	800	40	1g/min	/	62~94	/	
Fe_2O_3-CuO-CAC	Rice straw	40/5	Bubbling	700~950	40	1g/min	/	66~76	/	
Fe_2O_3-CuO-CAC	Rice straw	40/5	Bubbling	800	40	0.4~1.2g/min	/	64~73	/	Shen[31]
Fe_2O_3-CuO-CAC	Rice straw	40~100/5	Bubbling	800	40	1g/min	/	73~82	/	
Manganese ore	Rice husk	0.5	Bubbling	750~950	30	50%	/	30~80	/	Yin[32]

Fe_2O_3	Pine	0.25/1	Fixed	750~850	30	0	12.6~13.3	/	46~77	Liu[33]
Fe_2O_3	Pine	0~1/1	Fixed	850	30	0	11.1~13.3	/	64~77	
Fe_2O_3	Pine	0.25/1	Fixed	850	30	0~1	11~13.2	/	68~81	
Fe_2O_3	Pine/PE	0.25/1	Fixed	850	30	0.25	/	/	77~89	
Fe_2O_3-CaO	Pine/PE	0.25/1	Fixed	850	30	0.25	/	/	88~92	
Copper ore	Pine	15/1.7	Bubbling	800	10	/	5.8	26.6	83.2	Guo[34]
Hematite	Pine	15/1.7	Bubbling	800	10	/	12.1	55.1	64.6	
Fe_2O_3-Al_2O_3	Pine	15/1.7	Bubbling	800	/	/	12.6	81.7	60.1	Zhao[35]
CuO-$CuAl_2O_4$	Pine	15/1.7	Bubbling	800	/	/	5.9	95.6	30.8	
CuO-$CuAl_2O_4$	Pine	15/1.7	Bubbling	600~850	/	/	5.9~8.0	59~99	25~47	
Copper ore	Pine	15/1.7	Bubbling	800	/	/	5.8	83.2	26.2	
Cu-Fe oxides	Pine	0.4	Bubbling	800	/	0.75	2.4~7.6	66~95	/	Niu[36, 37]
Cu5Fe5	Pine	0.4	Bubbling	500~900	/	0.75	4.9~7.6	56~97	/	
Cu5Fe5	Pine	0.4	Bubbling	800	/	0.4~1.25	7.3~7.9	72~95	/	
Cu5Fe5	Pine	0~0.8	Bubbling	800	/	0.75	4.7~10.4	66~97	/	
Hematite	Pine	0~0.4	Bubbling	800	/	0.15ml/min	/	58~78	60~70	Jin[38]
Hematite	Pine	0.2	Bubbling	800	/	0~0.3ml/min	/	68~77	65~70	
Hematite	Pine	0.2	Bubbling	700~950	/	0.15ml/min	/	56~85	60~79	
$CoFe_2O_4$	Pine	0.4~3.2	Fixed	900	/	/	6~15	12~29	12~25	Wang[39, 40]
$CoFe_2O_4$	Pine	0.8	Fixed	900	/	30~50%	12~13	41~60	42~54	
$CoFe_2O_4$	Pine	0.8	Fixed	700~900	/	50%	11~12	50~70	38~79	
Fe_2O_3	Algae	0~0.4	Fixed	850	10	0.0432g/min	11.6~14.2	62~77	68~81	Liu[41-46]

Fe_2O_3	Algae	0.25	Fixed	700~900	10	0.432g/min	10.2~12.1	57~78	53~82	
Fe_2O_3	Algae	0.25	Fixed	850	10	0~0.072g/min	11.7~14.7	67~71	52~82	
$CaFe_2O_4$	Algae	/	Fixed	650~850	30	/	/	/	34~89	
$Ca_2Fe_2O_5$	Algae	/	Fixed	650~850	30	/	/	/	38~92	
$CaFe_{2-x}Co_xO_5$	Algae	1/3	Fixed	850	20	50ml/min	11.4~16.3	59~78	69~91	
Fe_2O_3-CaO	Algae	0.834/0.25	Fixed	600~850	30	/	13.3~14.9	/	16~66	
$Ca_2Fe_2O_5$ (Mg/Al/Zn)	Algae	0.4	Fixed	850	20	50ml/min	11~13	73~84	80~95	
$Ca_{2-x}Sr_xFe_2O_5$	Algae	1/3	Fixed	850	20	0.024g/min	13~15	60~82	70~99	
Fe_2O_3(K-doped)	Rice straw	0.25	Fixed	900	30	0.03g/min	/	/	57~85	Liao[47]
Fe_2O_3	Rice straw	0~0.4	Fixed	850	30	/	/	55~81	53~58	Wu[48, 49]
Fe_2O_3	Rice straw	0.2	Fixed	700~900	30	/	/	46~87	33~63	
Fe_2O_3-CaO	Rice straw	/	Fixed	850	30	0~0.048g/min	/	90~92	67~95	
Fe_2O_3-CaO	Rice straw	/	Fixed	600~850	30	0.288g/min	/	15~92	27~95	
Mn-Fe-Al_2O_3	Rice straw	0.2	Fixed	650~850	25	0.0432g/min	/	44~94	34~90	Chen[50]
Mn-Fe-Al_2O_3	Rice straw	0.2	Fixed	850	25	0~0.072g/min	/	75~95	63~93	
Mn-Fe-Al_2O_3	Rice straw	0~0.3	Fixed	850	25	0.0432g/min	/	83~95	83~93	
Fe_2O_3	Algae (microwave)	0.5/0.5	Fixed	800	20	/	/	77~87	57~72	Hu[52, 53]
Fe_2O_3-Al_2O_3	Rice straw	1/1	Fixed	750~950	10	2.8	/	66~88	/	Hu[54-56]
Fe_2O_3-Al_2O_3	Rice straw	1/1	Fixed	900	5~25	2.8	/	66~85	/	

Fe_2O_3-Al_2O_3	Rice straw	1/1	Fixed	900	20	2~4.8	/	76~95	/	
Fe_2O_3-ATP-K	Coffee ground	1/1	Bubbling	900	60	0.23g/min	/	72~86	/	
Fe_2O_3-ATP-K	Coffee ground	1/1	Bubbling	800~900	60	0.23g/min	/	62~86	60~96	Zhang[58]
Fe_2O_3-ATP-K	Coffee ground	0.25~2	Bubbling	900	60	0.23g/min	/	57~93	61~95	
Fe_2O_3-ATP-Al_2O_3	Activated Carbon	/	Bubbling	750~900	60	/	/	46~90	35~98	Wang[59]
$CuFe_2O_4$-ATP	Kitchen waste	0~1	Bubbling	850	60	1g/min	/	64~85	57~78	Wang[60]

[a] OC/B, the mass ratio of OC/biomass for the fixed/bubbling fluidized bed or the OC mass/biomass feeding rate.
[b] R_t, reaction time for gasification.
[c] H_2O, the additional reactant gas presenting in three forms, such as the mass ratio of steam/biomass, the steam concentration in the flow, the steam feeding rate.

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