

Supplementary Material

List of Tables

Table S1. Thermogravimetric parameters of biomass fuels under N₂ and air environment.

Fuels (from this study unless stated)	Under N ₂			Under Air (21%O ₂ /79%N ₂)					
	Devolatilisation zone			Devolatilisation zone			Char combustion zone		
	Temp Range (°C)	Peak Temp T _{peak} (°C)	Max. rate of weight loss R _{max} (wt% /min)	Temp Range (°C)	Peak Temp T _{peak} (°C)	Max. rate of weight loss R _{max} (wt% /min)	Temp Range (°C)	Peak Temp T _{peak} (°C)	Max. rate of weight loss R _{max} (wt% /min)
BS	190–420	335	16.06	205–305	288	39.72	385–465	401	9.14
MIS	205–435	341	17.40	215–315	295	38.18	360–460	387	9.44
WW	210–440	371	17.66	222–352	330	26.82	390–510	456	7.10
WS	195–445	333	14.96	210–320	293	39.22	340–570	403	4.78
SRC	215–425	367	19.26	232–362	338	32.87	410–510	483	9.47
WP	220–460	376	19.00	235–370	346	29.17	410–540	477	6.15

Table S2. Thermogravimetric parameters of biomass fuels under CO₂ and oxy-fuel environment.

Fuels (from this study unless stated)	Under CO ₂						Under Oxy (30%O ₂ /70%CO ₂)					
	Devolatilisation zone			Char CO ₂ reaction zone			Devolatilisation zone			Char combustion zone		
	Temp range (°C)	Peak Temp T _{peak} (°C)	Max. rate of weight loss R _{max} (wt% /min)	Temp range (°C)	Peak Temp T _{peak} (°C)	Max. rate of weight loss R _{max} (wt% /min)	Temp range (°C)	Peak Temp T _{peak} (°C)	Max. rate of weight loss R _{max} (wt% /min)	Temp range (°C)	Peak Temp T _{peak} (°C)	Max. rate of weight loss R _{max} (wt% /min)
BS	200–380	336	15.83	682–912	809	3.98	215–315	296	43.40	412–484	433	11.59
MIS	210–385	343	17.99	750–940	912	3.65	228–312	299	47.41	368–464	388	10.24
WW	230–410	370	17.33	765–935	909	3.14	222–362	335	27.97	415–515	465	8.37
WS	198–378	331	15.09	790–950	938	2.86	210–300	285	43.83	315–535	378	4.88
SRC	220–400	367	19.24	788–928	889	3.26	218–362	331	36.40	440–505	479	12.65
WP	215–415	379	19.09	845–950	945	3.42	230–370	340	31.84	435–535	474	9.62

List of Figures

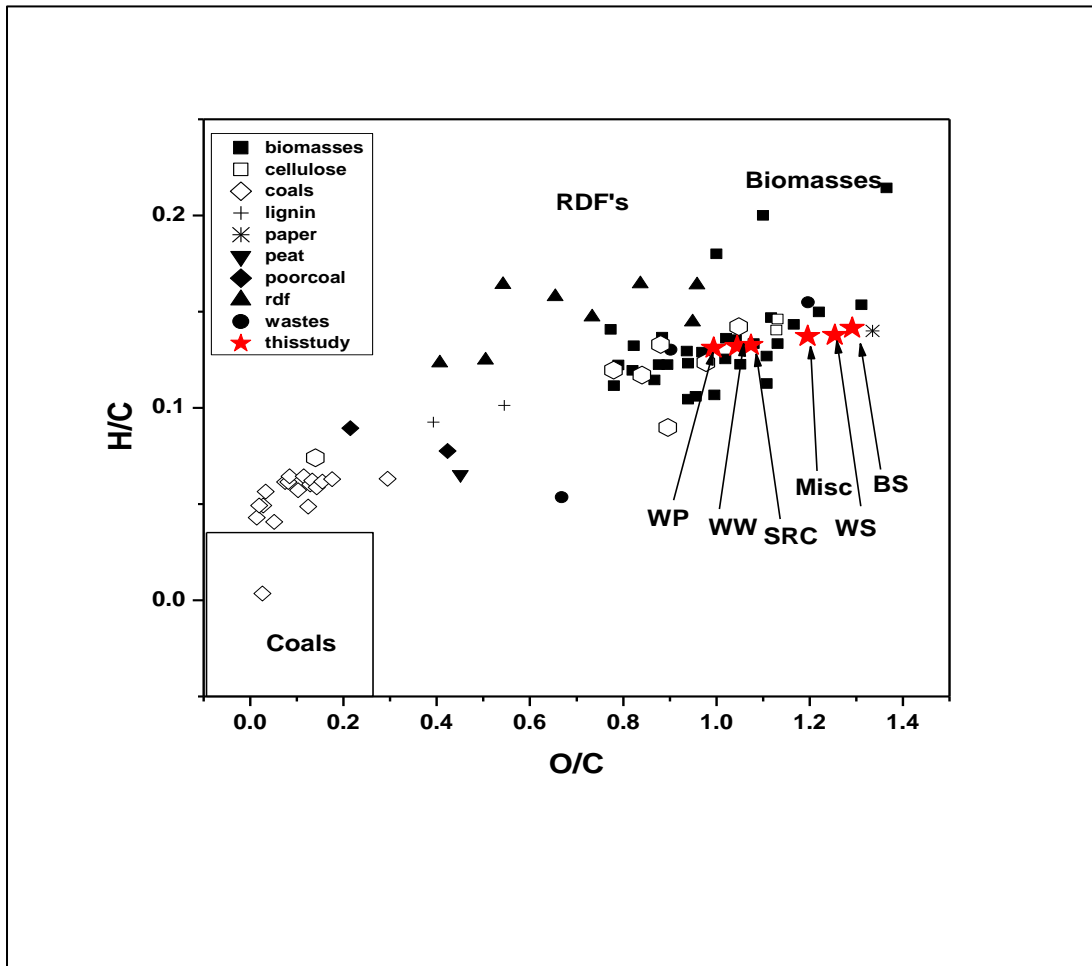


Fig. S1. Van Krevelen plot for studied biomass fuels; BS, MIS, WW, WS, SRC and WP in comparison with other fuels including biomass (cotton stalk, shea meal, sugar cane bagasse and RDF = refuse derived fuels) [1].

References

1. Senneca O. Kinetics of pyrolysis, combustion and gasification of three biomass fuels. Fuel processing technology. 2007 Jan 1;88(1):87-97.