

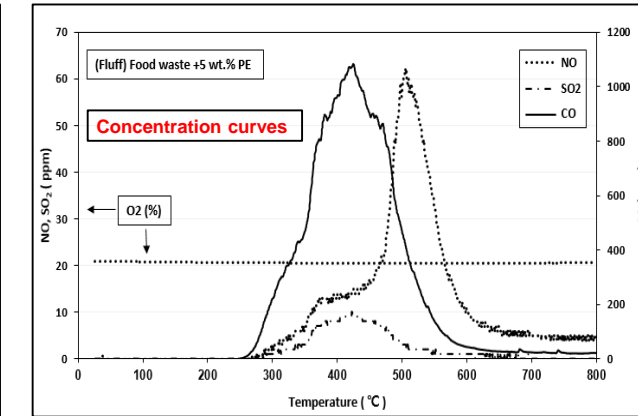
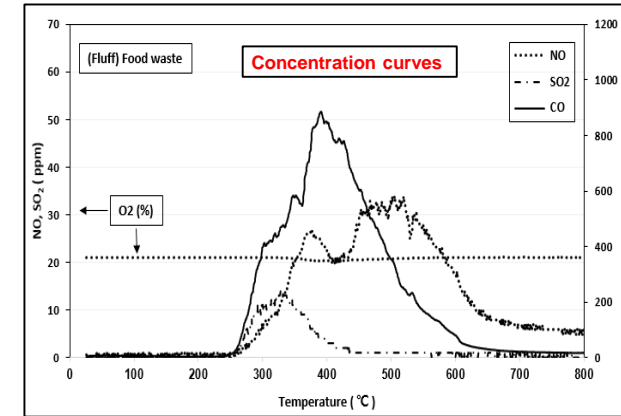
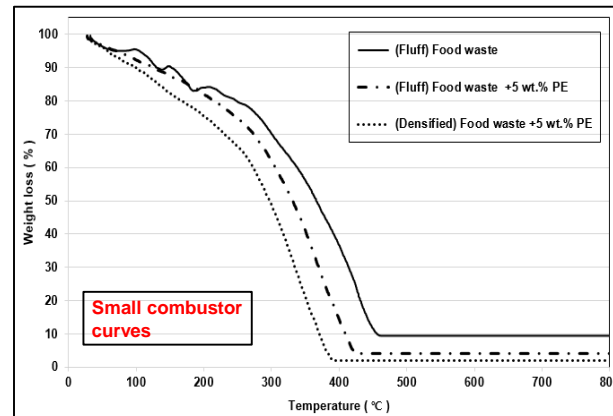
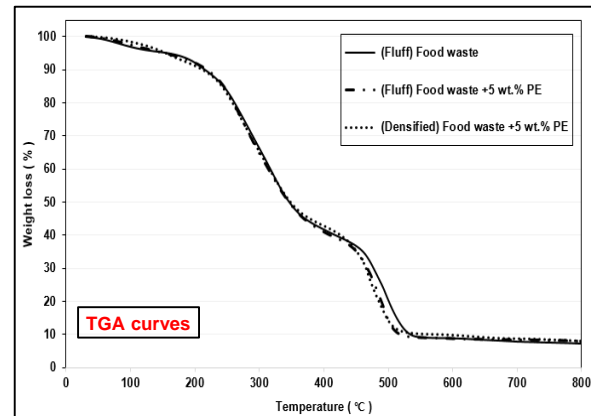
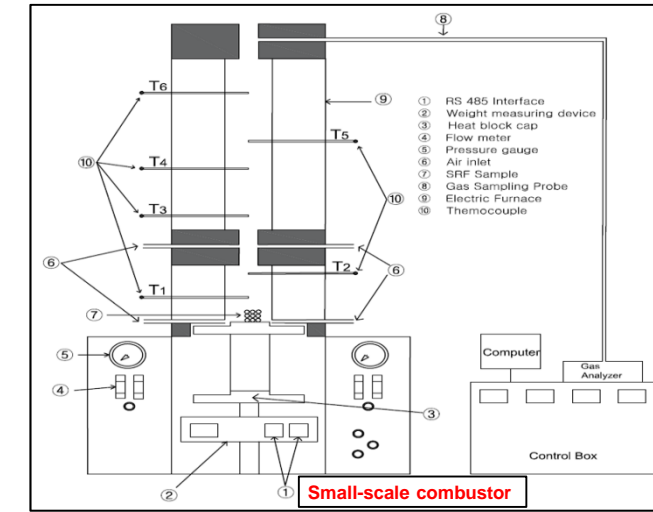
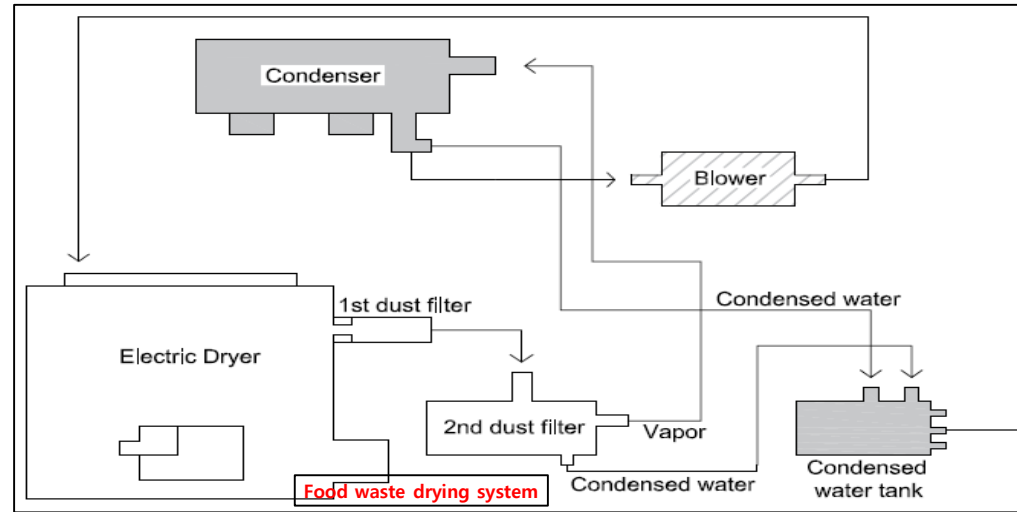
Objectives

◆ In 2017, the amount of municipal waste generated in South Korea was 53,489.5 tons/day and almost 30% of this was food waste

◆ When dried, food waste with high organic matter contents exhibit a low heating value of approximately 16,750 kJ/kg

◆ In the present study, solid refuse fuel samples made by mixing dried food waste with 3–5 wt.% waste plastic were subjected to proximate and ultimate analysis, heating value measurement.

◆ Combustion experiments were performed in a small-scale combustor, and the combustion characteristics of mixed SRF samples, as well as the combustion gases produced, were analyzed.



Components	Water (wt.%)	Ash (wt.%)	Volatile matter (wt.%)	Fixed carbon (wt.%)	Fuel ratio (FC/VM)	Low heating value (kcal/kg-wet)
(fluff) Food waste	9.1	9.9	68.9	12.1	0.18	4,030
(fluff) Food waste +5 wt.% PE	8.2	10.4	69.6	11.8	0.13	4,210
(densified) Food waste +5 wt.% PE	2.7	10.5	76.1	10.7	0.14	4,720

Components	C (wt.%)	H (wt.%)	N (wt.%)	O (wt.%)	S (wt.%)	Cl (wt.%)	C/H
(Fluff) Food waste	51.74	6.79	3.36	36.53	0.64	0.95	7.62
(Fluff) Food waste +5 wt.% PE	54.71	7.07	3.20	34.92	0.19	1.06	7.58
(Densified) Food waste +5 wt.% PE	55.27	7.22	3.60	31.90	0.73	1.27	7.65

Conclusions

- 1 In the small-scale combustor, the temperature at which the weight reduction was complete was 390°C for FW-1, 420°C for FW-2, and 460°C for FW-3, which were lower compared to the TGA results.
2. Regardless of the samples, all of the three gases(CO, SO₂ and NO) began to be generated at 250°C. The NO concentration was the highest in the temperature range of 380-550°C for FW-1, at 550°C for FW-2, and at 560°C at FW-3. NO was continuously generated until 800°C even though the concentration was lower than 10 ppm.