Table 1: Estimated material composition of 'as received' trommel fines by visual inspection and hand separation

***COMPONENT**	**Wt%**
Dust[a]	10.8 ± 4.3
Plastics	12.9 ± 2.1
Stones/glass	6.8 ± 1.7
Pyrolylazble fraction[b]	69.5 ± 5.8

* Dry basis;

[a] = particles with diameter < 0.5 mm

[b] = contains ash, volatile matter and fixed carbon

Table 2**.** Characteristics of PT trommel fines feedstock prepared for fast pyrolysis (0.5 – 2 mm)

ANALYSIS	**PT (0.5 - 2 mm)** [b]
Ash content [a] (wt.%)	36.2 ± 1.85
Volatile Matter [a] (wt.%)	56.3 ± 1.50
Fixed Carbon (wt.%) [c]	7.52
Bomb Calorimeter (MJ kg^{-1}) [a]	13.8 ± 0.33
Elements (wt.%) *	
Nitrogen	2.75 ± 3.16
Carbon	33.71 ± 6.93
Hydrogen	4.62 ± 0.92
Sulphur	0.26 ± 0.20
Oxygen	17.06 ± 8.21
***remainder was classified as ash** [a] dry basis; [b] prepared size fraction for fast pyrolysis experiments; [c] calculated by difference; PT – Physical pre-treated Trommel Fines	

Table 3. Mass balance summary for effect of temperature on fast pyrolysis of prepared trommel fines

Run No.	**TIR-400**	**TIR-500**	**TIR-600**	**TIR-700**
Fast Pyrolysis Temperature (°C)	**400**	**500**	**600**	**700**
Feed Moisture (wt.%)	3.02 ± 0.25	2.69 ± 0.07	2.45 ± 0.84	2.95 ± 0.34
Run duration (minutes)	60	60	60	60
Average Feed rate (g h^{-1})	126.8 ± 5.10	158.9 ± 13.8	114.4 ± 4.21	120.8 ± 5.11
Total Liquid/Tar (wt.%) [a b]	**25.3 ± 0.04**	**32.6 ± 0.56**	**17.4 ± 0.37**	**12.8 ± 0.05**
PC Organics	5.84 ± 0.0	12.5 ± 0.40	3.79 ± 0.30	2.37 ± 0.08
SC Organics	6.05 ± 0.21	7.07 ± 0.72	7.14 ± 0.06	6.63 ± 0.32
Reaction Water	13.4 ± 0.25	13.0 ± 0.56	6.49 ± 0.04	3.78 ± 0.35
Solid Residue (wt.%) [a c]	**64.9 ± 0.04**	**52.1 ± 1.23**	**51.5 ± 0.60**	**48.6 ± 0.03**
Gas (wt.%) [a]	**7.29 ± 0.69**	**12.9 ± 0.02**	**18.8 ± 135**	**24.6 ± 1.42**
H_2	0	0	0.01	0.01
CO	0.04	0.08	0.10	0.09
Methane	0.21	0.52	0.82	1.51
CO_2	5.48	8.82	10.87	13.56
Ethylene	0.07	0.25	1.50	3.33
Ethane	0.1	0.24	0.38	0.48
Propylene	1.21	2.45	2.68	1.94
Propane	0.12	0.41	1.68	2.32
n-Butane	0.05	0.16	0.76	1.33
Closure (wt.%) [a]	**97.5 ± 0.67**	**97.6 ± 0.69**	**87.8 ± 0.38**	**85.9 ± 1.50**
TIR- Temperature Investigation Run; [a] dry basis; [b] ash free; [c] including oil solid content; PC –Primary condensate; SC – Secondary condensate				

Table 4. Water content, solids contents, elemental composition and heating value of liquid products produced from temperature investigation (TIR) experiments.

LIQUID/TAR PRODUCTS	**TIR-400**	**TIR-500**	**TIR-600**	**TIR-700**
Primary Condensate (wt.%)				
Water content	5.14 ± 0.30	5.8 ± 0.56	3.69 ± 0.26	4.19 ± 0.17
Solid content	nd	3.58 ± 0.85	8.62 ± 0.80	16.2 ± 0.40
Elemental Analysis (wt.%) [a]				
Nitrogen	3.92	2.91	5.42	5.83
Carbon	65.6	72.9	63.7	66.7
Hydrogen	7.62	8.75	6.74	6.30
Sulphur	0.17	0.10	0.33	1.17
Oxygen [b]	22.7	15.3	23.8	20.0
Bomb Calorimeter (MJ kg^{-1})	30.5 ± 0.34	32.4 ± 0.09	26.9 ± 0.74	23.6 ± 0.62
HHV dry (MJ kg^{-1}) [a]	25.6	31.2	22.3	22.9
Secondary Condensate (wt.%)				
Water content	72.8 ± 1.31	67.9 ± 2.78	55.4 ± 0.89	50.3 ± 1.27
Elemental Analysis (wt.%)				
Nitrogen	5.10	6.36	7.76	8.93
Carbon	51.8	54.7	52.3	53.5
Hydrogen	6.43	6.63	7.26	7.54
Sulphur	0.99	1.47	1.41	1.45
Oxygen [b]	35.7	30.9	31.3	28.6
HHV dry (MJ kg^{-1}) [a]	17.0	17.5	15.9	15.9
TIR- Temperature Investigation Run; [a] dry basis; [b] calculated by difference; [c] Eq. 1; nd - not detected				

Table 5. Ash content, elemental composition and heating value of solid products (char pot) produced from TIR fast pyrolysis of trommel fines.

SOLID PRODUCTS	**TIR-400**	**TIR-500**	**TIR-600**	**TIR-700**
Ash content (wt.%) [a]	62.8 ± 0.64	86.3 ± 0.52	77.6 ± 0.24	75.4 ± 0.46
Char (wt.%) [a]	37.2 ± 0.64	13.7 ± 0.52	22.4 ± 0.24	24.6 ± 0.46
Elemental Analysis (wt.%)				
Nitrogen	0.50	0.33	0.56	0.42
Carbon	21.3	9.0	18.5	13.4
Hydrogen	1.23	0.57	0.64	0.45
Sulphur	0.33	0.23	0.71	0.54
Oxygen [b]	13.9	3.51	1.97	9.78
Bomb Calorimeter (MJ kg^{-1}) [a]	8.55 ± 0.23	4.12 ± 0.71	6.17 ± 0.44	6.63 ± 0.52
TIR- Temperature Investigation Run; [a] dry basis; [b] calculated by difference				