Electronic Supplementary Material (ESI) for Green Chemistry.

Appendix

Table A.1: Summary of studies conducted in fluidized beds with ZSM-5 that report aromatic yields.

Study	**Feed Type**	**Fluidization type**	**Fluidizer gas**	**Temperature (°C)**	**Reactor Diameter (cm)**	**Fluidized Bed Weight (g)**	**τ_{cat} (s)**
This study	Cellulose	Bubbling	Helium	500	4.92	30 - 240	300 - 21,000
Karanjkar (2014)[1]	Cellulose	Bubbling	Helium	500	4.92	30 - 250	15,000 - 72,000
Dayton (2015)[2]	Pine	Riser	Nitrogen	500 - 600	5.00	110,000 - 140,000	9,000
Jae (2014)[3]	Pine	Bubbling	Nitrogen	600	9.72	500	12,000
Jae (2014)[3]	Pine	Bubbling	Recycle	600	9.72	500	12,000
Paasikallio (2014)[4]	Pine	Circulating	Recycle	520	NA	94,000	16,920
Mullen (2013)[5]	Switchgrass	Turbulent?	Nitrogen	450 - 500	7.6	615	1,476
Paasikallio (2013)[6]	Forest Thinnings	Bubbling	Nitrogen	400 - 550	5.00	100	7,200
Lappas (2002)[7]	Biomass	Riser	Nitrogen	400	0.7	400	4,364

(Table A.1: Summary of studies conducted in fluidized beds with ZSM-5 that report aromatic yields. Continued)

Study	WHSV (h^{-1})	Feed Rate (g/hr)	Fluidizer flow. (slpm)	u_0 (cm/s)	gas (wt%)	solid (%wt)	total liquid (%wt)	aq. liquid (%wt)	org. liquid (%wt)	max. aromatics (%wt)
This study	0.17 - 12.67	41 - 405	1.00	2.48	46%	7%	-	-	16%	15%
Karanjkar (2014)[1]	0.24 - 0.50	22 - 60	0.48 - 1.28	1.19 - 3.17	41%	6%	-	-	22%	22%
Dayton (2015)[2]	0.40	45,000	187	478	7%	50%	28%	18%	10%	2%
Jae (2014)[3]	0.30	165 - 345	3.2	2.25	30%	21%	36%	18%	18%	9%
Jae (2014)[3]	0.30	165 - 345	3.2	2.25	30%	24%	44%	14%	30%	11%
Paasikallio (2014)[4]	0.21	20,000	NA	400	21%	27%	51%	19%	32%	2%
Mullen (2013)[5]	2.44	1,500	75	800	26%	21%	51%	22%	29%	3%
Paasikallio (2013)[6]	0.5	200	3.5	8.4	48%	18%	35%	21%	14%	9%
Lappas (2002)[7]	0.83	330	30	165 - 150	14%	22%	67%	30%	37%	3%

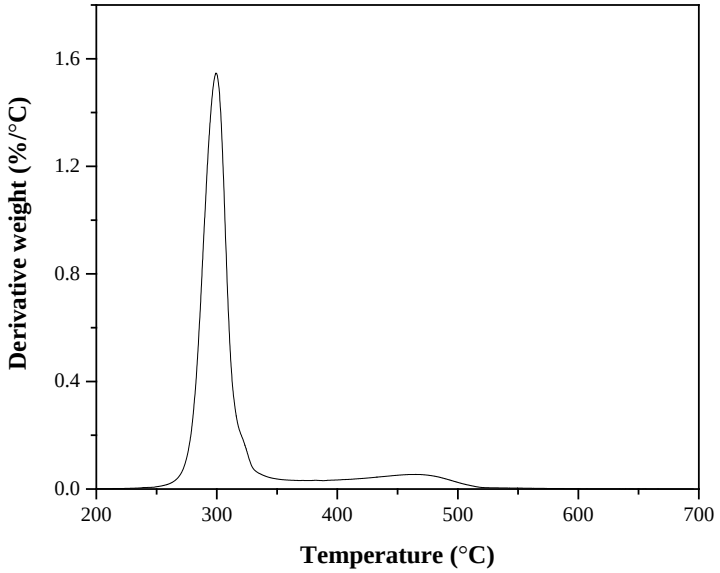

Figure A.1: Derivative of weight change of temperature programmed oxidation of a mixture of pure cellulose and fresh HZSM-5 catalyst.

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