

SUPPLEMENTARY INFORMATION

Effect of palladium-doped magnetite nanoparticles in the hydrothermal liquefaction of biomass to bio-oil

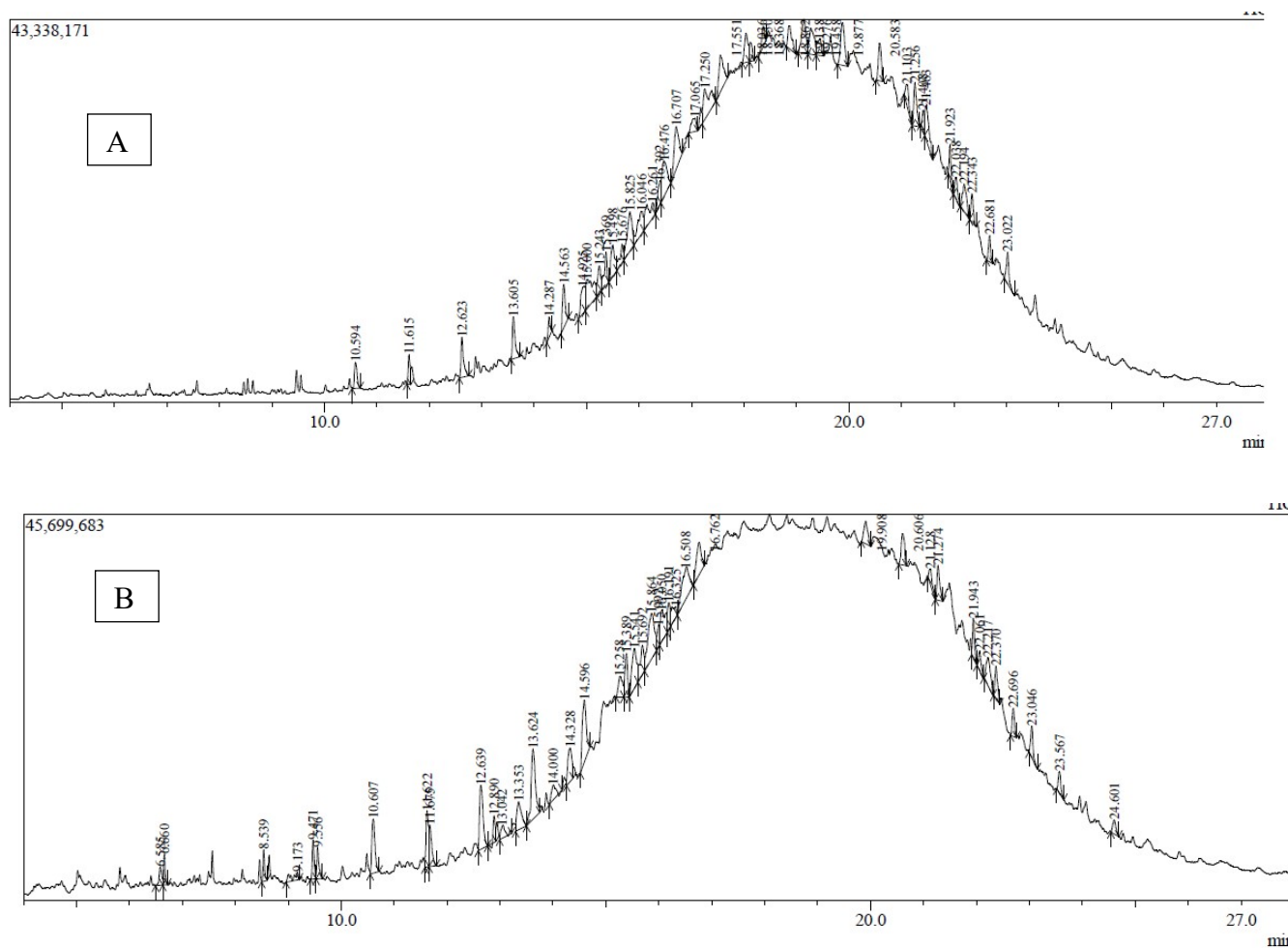
Adson Tumwebaze^{1,2}, Edward Mubiru¹, Dan Egesa^{1*}

¹Department of Chemistry, College of Natural Sciences, Makerere University, P.O. Box 7062, Kampala, Uganda

²National Environment Management Authority, P.O. Box 22255, Kampala, Uganda

*Corresponding Author: Dan Egesa (dan.egesa@mak.ac.ug)

Figure S1: GC-MS chromatograms for bio-oil: A - Un-catalysed, B - magnetite nanoparticles, C - palladium-doped magnetite nanoparticles.



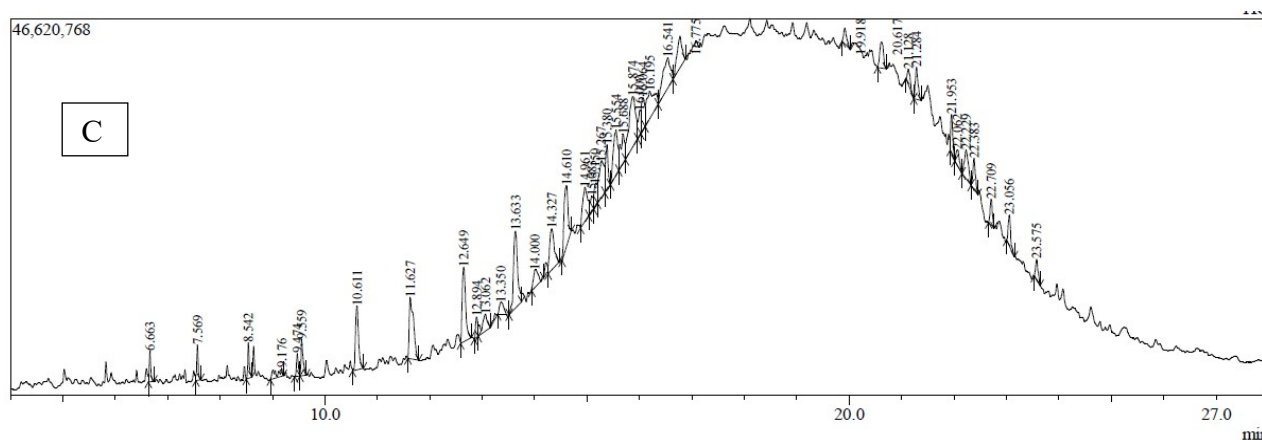


Table S1: Major compounds identified from the GC-MS spectrum of bio-oil in the absence and presence of catalysts.

Retention time (min)	Compound name	Relative Area (%)		
		Absence of Catalyst	With magnetite	With Pd- doped magnetite
6.585	Phenol, 4-ethyl-2-methoxy-	1.57	1.14	
8.542	Pentadecane		1.13	1.14
9.176	2-Methyltetracosane		1.02	1.05
9.471	4-Bromomethyl-piperidine-1- carboxylic acid		1.77	
9.474	N-(3-Piperidiny) propanamide,	1.21	1.01	
9.556	Hexadecane		1.51	1.53
10.611	Heptadecane	1.56	3.88	4.02
11.627	Heptadecane	1.38	3.18	5.28
11.657	2,6,10,14-tetramethyl- Hexadecane		2.34	
12.649	Nonadecane	2.4	5.16	5.28
12.894	methyl ester hexadecanoic acid		1.13	
13.062	Heneicosane	2.61		1.95
13.353	n-Hexadecanoic acid		2.97	
13.421	Octadecanoic acid		4.55	
13.633	Heneicosane		5.75	5.55
14	Eicosane		1.39	1.76
14.327	Tetratetracontane	1.07		3.91
14.61	Heneicosane	2.87	4.7	4.1
14.961	Eicosane	2.69		3.26
15.083	1-Ethynylcyclododecanol			1.16
15.139	cis-Vaccenic acid	4.76		

15.15	4-Methylheneicosane			1.44
15.267	Tetratriacontane			3.93
15.38	Hexadecanamide	2.51	2.33	2.27
15.554	Heneicosane	2.87	2.37	2.28
15.688	N-methyl-Arachidamide,	1.52	2.06	2.58
15.874	Eicosane	3.59		7.14
15.864	Tetracosane		4.89	6.51
15.992	dihydro-5-tetradecyl- 2(3H)- Furanone		1.17	
16	5,15-Dimethylnonadecane			1.2
16.05	N,N-Dimethylpalmitamide	3.6	2.32	
16.064	N-ethyl- Arachidamide	3.24	2.68	2.14
16.165	Heneicosane, 11-decyl-	1.07	1.58	4.46
16.541	Heneicosane	1.73	5.45	5
16.775	Heneicosane	4.76	3.71	3.32
17.065	Nonahexacontanoic acid	1.53		
17.551	Heneicosane	2.89		
18.036	Hexatriacontane	2.55		
18.15	N-3-methyl butyl-Octanamide,	2.13		
18.368	Tetracosane	1.39		
19.138	Tetratriacontane	2.5		
19.276	Squalane	2.03		
19.458	Hexatriacontane	1.61		
19.918	Tetracosane	4.03	1.98	
20.617	Tetracosane	2.55	2.32	1.96
21.284	Tetratracontane		2.16	1.76
21.408	17.alpha.H-Trisnorhopane	1.1		
21.953	Tetracosane	2.88	1.72	1.55
22.061	14-methyl-5,alpha.-Cholest-8-en- 3-one,	1.4	1.15	
22.062	Hexatriacontane	2.45	1.44	1.03
22.229	Squalane	3.05	2.53	2.34
22.383	28-Nor-17.alpha.(H)-hopane	1.45	1.47	1.52
22.709	Tetratriacontane	1.5	1.26	1.18
23.056	17.alpha.(H),21.beta.(H)-Hopane	1.77	1.62	1.49
23.575	Hexatriacontane	1.32	1.18	1.09
	Total	87.14	90.02	96.18
