Table S2. Effect of equivalence ratio (ER) on tar composition at a gasification temperature of 900 ℃

Category	Compounds	Relative content（%）					
		0.05	**0.10**	**0.15**	**0.20**	**0.25**	**0.30**
Esters	Methyl 2-methoxybenzoate	ND	ND	ND	ND	ND	0.3
	2-Ethylhexyl formate	ND	ND	ND	ND	0.3	ND
	tert-Butyl phenyl carbonate	ND	ND	ND	ND	0.25	0.89
	Methyl palmitate	ND	4.05	1.84	1.64	2.62	2.71
	4-Hydroxybutyl stearate	ND	0.45	ND	ND	5.94	ND
	Methyl 2-hydroxyhexadecanoate	ND	ND	ND	ND	ND	0.38
	Lauric acid 2,3-diacetoxypropyl ester	ND	ND	ND	0.34	0.35	0.42
	Methyl stearate	ND	ND	6.08	5.14	6.43	7.24
	(S)-Methyl 12-methyltetradecanoate	ND	ND	ND	ND	ND	0.23
	Methyl isostearate	3.08	5.82	ND	ND	ND	ND
	Decyl 11-hydroxyundecanoate	ND	ND	0.29	ND	ND	ND
	Heptyl 11-hydroxyundecanoate	ND	0.19	ND	ND	ND	ND
	E-10,13,13-Trimethyl-11-tetradecen-1-yl acetate	ND	ND	0.22	ND	ND	ND
	Isobutyl (Z)-9-tetradecenoate	ND	ND	0.89	ND	ND	ND
	Ethyl 3-oxo-octadecanoate	ND	ND	2.4	2.94	1.79	3.45
	Methyl 16-hydroxyhexadecanoate	ND	4.24	ND	ND	ND	ND
	2-Monopalmitin	8.95	ND	ND	ND	9.93	ND
	Ethyl palmitate	ND	ND	ND	ND	0.52	ND
	Isobutyl palmitate	10.29	7.46	21.58	34.65	15.28	19.66
	Glyceryl monostearate	5.94	5.71	ND	ND	ND	3.41
	2-Monooctadecanoylglycerol	0.3	ND	ND	ND	3.89	ND
	Fumaric acid, 2-butylhexadecyl ester	0.46	ND	ND	ND	ND	ND
	Stearyl hexanoate	ND	ND	ND	ND	0.48	11.83
	Isobutyl stearate	ND	3.59	5.87	10.49	12.97	10.77
	Heptadecyl hexanoate	ND	ND	1.12	0.43	ND	ND
	Methyl 12-oxooctadecanoate	ND	ND	ND	3.43	ND	ND
	Ascorbyl stearate	ND	ND	4.69	ND	ND	ND
	Isobutyl (Z)-10-heptadecenoate	1.18	ND	ND	ND	ND	ND
	Methyl 14-(2-octylcyclopropyl)tetradecanoate	ND	ND	ND	ND	ND	0.61
	Total	**30.2**	**31.51**	**44.98**	**59.06**	**60.75**	**61.9**
Ketones	3,5-Heptadien-2-one	ND	2.42	6.28	ND	5.63	6.77
	1-(2,5-Dimethoxy-4-methylphenyl)propan-2-one	ND	0.18	0.6	ND	ND	ND
	Bicyclo[3.2.2]non-2,6-dien-5-ol-4-one	0.19	ND	ND	ND	ND	ND
	2,7-Bis(spirocyclopropane)bicyclo[2.2.1]heptan-5-one	1.02	ND	ND	ND	ND	ND
	1-(5-Hexyl-2,4-dihydroxyphenyl)ethanone	7.66	13.58	9.94	18.73	15.35	17.08
	1,8-Diacetyl-9,10-anthraquinone	ND	ND	ND	ND	ND	0.15
	7,9-Di-tert-butyl-1-oxaspiro[4.5]deca-6,9-dien-2,8-dione	ND	ND	ND	ND	0.28	ND
	Total	**8.87**	**16.18**	**16.82**	**18.73**	**21.26**	**24**
Alcohols	Glycerol	ND	ND	ND	ND	0.96	ND
	2-Benzyloxyethanol	ND	ND	ND	ND	ND	0.12
	Exo-bicyclo[2.2.1]heptan-2-ol	ND	3.28	ND	ND	ND	ND
	2-Propyl-1-pentanol	ND	ND	ND	0.36	0.3	ND
	Bicyclo[2.2.1]heptan-7-ol	ND	ND	0.22	ND	ND	ND
	o-Phthalyl alcohol (1,2-benzenedimethanol)	ND	ND	ND	0.14	ND	ND
	3-Deoxytetritol (3-deoxypropane-1,2-diol)	ND	ND	2.05	ND	ND	ND
	2-(Octadecyloxy)ethanol	ND	ND	0.67	ND	ND	ND
	3-Deoxy-17β-estradiol	3.4	ND	0.65	1.38	ND	ND
	Total	**3.4**	**3.28**	**3.59**	**1.88**	**1.26**	**0.12**
Phenols	4-(Methoxymethyl)-2,6-dimethylphenol	ND	ND	ND	ND	0.27	ND
	4,6-Di-tert-butylpyrogallol (4,6-di-tert-butylbenzene-1,2,3-triol)	ND	ND	ND	ND	ND	0.12
	Phenol	2.79	ND	ND	ND	ND	ND
	3,5-Di-tert-butylphenol	ND	ND	1.63	ND	ND	ND
	2,4-Di-tert-butylphenol	2.16	1.59	0.7	1.59	0.95	2.06
	2,5-Di-tert-butylphenol	ND	0.76	ND	ND	0.88	ND
	2,6-Di-tert-butylphenol	ND	ND	ND	0.42	ND	ND
	2,2'-Methylenebis(4-methyl-6-tert-butylphenol)	0.31	0.37	ND	0.43	0.27	0.51

	Total	**5.26**	**2.72**	**2.33**	**2.44**	**2.37**	**2.69**
Aromatics	Indene	ND	1.05	ND	ND	ND	ND
	2-Ethynyltoluene (o-Ethynyltoluene)	ND	0.72	ND	ND	ND	ND
	1-Phenyl-1-propyne	5.99	ND	ND	ND	ND	ND
	3-Phenyl-1-propyne	1.38	ND	0.8	ND	ND	ND
	1-(Cycloprop-2-en-1-yl)-2-methylbenzene	ND	0.19	ND	ND	ND	ND
	1,2-Dimethyl-3-ethylbenzene	ND	ND	ND	ND	1.11	ND
	1,3-Diethyl-5-methylbenzene	ND	ND	ND	ND	ND	0.58
	1-Methylene-1H-indene	ND	ND	ND	ND	ND	3.42
	Naphthalene	26.14	26.59	19.18	12.89	8.97	3.58
	1-Methylnaphthalene	2.96	0.98	1.54	ND	ND	ND
	2-Methylnaphthalene	1.21	0.66	ND	ND	ND	ND
	7H-Benzocycloheptene	ND	1.78	0.7	ND	0.76	ND
	1-(Pent-4-enyl)naphthalene	0.53	ND	0.49	0.7	ND	ND
	(1-Methylenepent-2-enyl)benzene	ND	ND	ND	ND	ND	0.13
	Biphenyl	0.26	0.29	ND	ND	ND	ND
	Acenaphthylene	8.2	8.5	4.84	2.37	1.83	2
	4a,9-Dihydro-2H-fluorene	ND	1.43	0.69	ND	0.52	ND
	Fluorene	0.78	ND	ND	ND	ND	ND
	1,2-Dihydroanthracene	0.51	ND	ND	ND	ND	ND
	1H-Phenalene	ND	ND	0.15	ND	ND	ND
	Phenanthrene	1.17	2.05	1.24	ND	ND	ND
	9-Methylfluorene	ND	0.3	ND	ND	ND	0.2
	1,4-Diethyl-1,4-dihydroanthracene	ND	ND	0.34	ND	ND	ND
	1,4-Dihydro-1,4-ethanoanthracene	0.32	ND	ND	ND	ND	ND
	9,10-Dimethylanthracene	0.46	ND	ND	ND	ND	ND
	9,10-Dihydro-1-methylphenanthrene	ND	ND	ND	ND	0.19	0.21
	1,2-Dihydro-1-phenylnaphthalene	ND	ND	ND	ND	0.35	ND
	1-Methyl-cyclobuta[a]dibenzo[c,f]heptaene	ND	ND	0.22	ND	ND	ND
	4,5-Dihydropyrene	ND	0.36	0.29	ND	0.36	ND
	1,4-Diphenylbutadiyne	ND	ND	0.24	ND	ND	ND
	1-Benylnaphthalene	ND	ND	0.14	ND	ND	ND
	2,3-Dihydrofluorene	0.34	ND	ND	ND	ND	ND
	1-Hexadecyl-2,3-dihydro-1H-indene	0.25	0.28	0.48	ND	ND	0.71
	Total	**50.5**	**45.18**	**31.34**	**15.96**	**14.09**	**10.83**
Furans	1,3-Dihydro-1,3-dimethoxyisobenzofuran	ND	0.23	0.23	ND	0.27	0.46
	2-Vinylfuran	0.77	ND	ND	ND	ND	ND
	Total	**0.77**	**0.23**	**0.23**	**0**	**0.27**	**0.46**
Aliphatic hydrocarbons	1,3,5,7-Tetraoxacyclooctane	ND	ND	0.22	ND	ND	ND
	1,5-Heptadiene	1	ND	ND	1.93	ND	ND
	(1α,3α,5α)-1,5-Divinyl-3-methyl-2-methylenecyclohexane	ND	0.90	0.49	ND	ND	ND
	Total	**1**	**0.90**	**0.71**	**1.93**	**0**	**0**