

# **Fast and isothermal hydrothermal liquefaction of polysaccharide feedstocks**

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1 Table

**Table S1** Tentative identities of organic compounds in biocrudes produced by isothermal HTL at 350 °C set-point temperature, 31.6 min and fast HTL at 500 °C set-point temperature, 1 min for the polysaccharide feedstocks

Compound Group	Compound Identified	Starch		Cellulose		Amylopectin		Amylose		Pectin		Chitin	
		Iso.	Fast	Iso.	Fast	Iso.	Fast	Iso.	Fast	Iso.	Fast	Iso.	Fast
Ketones	2-Cyclopenten-1-one,3-methyl-	✓		✓		✓		✓		✓		c	
	2-Cyclopenten-1-one,2,3-dimethyl-	✓		✓		✓		✓		✓	✓	✓	
	2-Cyclopenten-1-one	✓		✓		✓	✓	✓		✓			
	Ethanone,1-(3-hydroxyphenyl)-	✓	✓	✓		✓			✓		✓		
	3,6-Heptanedione			✓		✓	✓	✓					
	2-Cyclohexen-1-one, 6-methyl-3-(1-methylethyl)-	✓		✓		✓						✓	
	2,5-Hexanedione	✓		✓		✓	✓	✓					
	2-Cyclopenten-1-one,2-methyl-	✓		✓		✓		✓		✓		✓	
	1,2-Cyclopentanedione,3-methyl-	✓		✓				✓					
	2-Cyclopenten-1-one,3-ethyl-	✓		✓		✓		✓		✓		✓	
	Ethanone,1-(1-cyclohexen-1-yl)-	✓		✓				✓		✓		✓	
	Cyclohexanone,3-ethenyl-	✓		✓		✓		✓		✓		✓	
	2-Cyclopenten-1-one,3,4-dimethyl-	✓		✓		✓		✓		✓		✓	
	4,4-Dimethyl-2-cyclopenten-1-one	✓		✓				✓		✓		✓	
	2-Acetoncyclopentanone	✓		✓									
	1,3-Cyclopentanedione, 2,4-dimethyl-	✓											
	Cyclohept-4-enone	✓											
	2-Cyclopenten-1-one, 3-ethyl-2-hydroxy-	✓	✓			✓							
	3-Methylcyclopentane-1,2-dione					✓							
	3,4-dihydroxyphenyl-2-propanone					✓							
	2-Cyclohexen-1-one, 3,4-dimethyl-							✓		✓			
	5-Hexen-2-one, 5-methyl-3-methylene-							✓					
	Cyclopentanone									✓		✓	
	3-Methyl-3-cyclohexen-1-one									✓			
	2-Cyclohexen-1-one,3-methyl-									✓			
	Cyclohexanone									✓			
	2-Cyclopenten-1-one, 2,3,4,5-tetramethyl-											✓	
	3-Methylcyclopentane-1,2-dione		✓						✓		✓		
	Maltol		✓						✓				
	Ethanone,1-(2,5-dihydroxyphenyl)-		✓								✓		
	1,2-Cyclopentanedione		✓				✓		✓				✓
	2-Cyclohexen-1-one,4-(1-methylethyl)-						✓		✓				
	5,9-Dodecadien-2-one,6,10-dimethyl-,(E,E)-								✓				
	3-Buten-2-one, 4-(4-hydroxy-3-methoxyphenyl)-										✓		
	2-Hydroxy-3-propyl-2-cyclopenten-1-one										✓		

Compound Group	Compound Identified	Starch		Cellulose		Amylopectin		Amylose		Pectin		Chitin	
		Iso.	Fast	Iso.	Fast	Iso.	Fast	Iso.	Fast	Iso.	Fast	Iso.	Fast
Phenols	Phenol	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓
	Phenol,2-methyl-	✓		✓		✓		✓		✓		✓	
	Phenol,3-methyl-	✓		✓		✓		✓		✓	✓	✓	
	Phenol,2,3-dimethyl-			✓									
	Phenol,2,5-dimethyl-									✓			
	Phenol,4-ethyl-2-methoxy-									✓			
	Phenol,3,4-dimethyl-			✓				✓					
	Phenol,2,2'-methylenebis[6-(1,1-dimethylethyl)-4-methyl-		✓	✓	✓	✓					✓		
	Phenol, 2-methoxy-											✓	
	2-Methoxy-5-methylphenol				✓								
Indanone derivatives	1H-Inden-1-one,2,3-dihydro-	✓		✓		✓		✓		✓		✓	
	7-Methylindan-1-one	✓		✓		✓		✓		✓			
	Indan-1,2-dione, 4,7-dimethyl-					✓							
	1H-Inden-5-ol, 2,3-dihydro-			✓		✓		✓		✓			
	4-Hydroxy-1-indanone							✓		✓			
	1-Methylindan-2-one									✓			
Furan derivatives	2-Methyl-5-hydroxybenzofuran	✓	✓	✓		✓		✓			✓		
	2,4-Dimethylfuran	✓	✓	✓		✓		✓					
	2(3H)-Benzofuranone					✓							
	Benzofuran,4,7-dimethyl-							✓					
	Benzofuran,2-methyl-							✓		✓			
	2-Furancarboxaldehyde, 5-methyl-	✓			✓	✓	✓	✓	✓				✓
	5-Hydroxymethylfurfural		✓	✓	✓		✓		✓		✓		✓
	Benzofuran-2,3-dione,4,7-dimethyl-2,3-dihydro-	✓											
	2-Furancarboxylic acid,2-methylpropyl ester		✓										
	2-Methyl-5-hydroxybenzofuran												
	2,5-Furandicarboxaldehyde		✓		✓		✓		✓				✓
	Furyl hydroxymethyl ketone				✓		✓		✓				
	Furfural						✓						
	2-Acetyl-5-methylfuran						✓						
	2(5H)-Furanone						✓						
	2,2'-Bifuran				✓								
	2(5H)-Furanone, 5,5-dimethyl-												✓
	5-Acetoxyethyl-2-furaldehyde								✓				✓

Compound Group	Compound Identified	Starch		Cellulose		Amylopectin		Amylose		Pectin		Chitin	
		Iso.	Fast	Iso.	Fast	Iso.	Fast	Iso.	Fast	Iso.	Fast	Iso.	Fast
Benzene derivatives	Catechol		✓			✓				✓	✓		
	1,2-Benzenediol,4-methyl-	✓	✓	✓		✓				✓	✓		
	1,2-Benzenediol,3-methyl-	✓	✓	✓		✓					✓		
	2-Coumaranone			✓									
	1,3-Benzenediol,4-ethyl-		✓	✓						✓			
	1,4-Benzenediol,2-methyl-								✓				
	1,4-Benzenedicarboxaldehyde,2-methyl-	✓								✓			
	Benzene,ethoxy-											✓	
	Resorcinol,2-acetyl-		✓										
	Benzaldehyde, 3-hydroxy-		✓										
	Benzene,1,3-bis(1,1-dimethylethyl)-				✓								
	Benzaldehyde, 3-hydroxy-3-Formylphenol										✓		
	Resorcinol,2-acetyl-										✓		
	Hydrocoumarin										✓		
	4-Hydroxy-2-methylbenzaldehyde										✓		
	3-Hydroxy-2-methylbenzaldehyde										✓		
	Vanillin										✓		
	4-Ethoxystyrene										✓		
Acids	2-Hexenoic acid,3,4,4-trimethyl-5-oxo-,(Z)-		✓										
	n-Hexadecanoic acid				✓		✓		✓				
Alcohols	1-Dodecanol				✓		✓		✓				
	1-Decanol,2-hexyl-				✓				✓				
	1-Decanol, 2-octyl-				✓								
	n-Nonadecanol-1				✓								
	2-Isopropyl-5-methyl-1-heptanol								✓				
Esters	2-Propenoic acid, pentadecyl ester				✓		✓		✓				
	Hexadecanoic acid,2-hydroxy-1-(hydroxymethyl) ethyl ester				✓		✓						
Hydrocarbons	Nonane,5-butyl-						✓						
	Eicosane				✓				✓				
	Heptadecane				✓				✓				✓
	Tetracosane												✓
	Tetratriacontane												✓
	Hexatriacontane												✓

Compound Group	Compound Identified	Starch		Cellulose		Amylopectin		Amylose		Pectin		Chitin	
		Iso.	Fast	Iso.	Fast	Iso.	Fast	Iso.	Fast	Iso.	Fast	Iso.	Fast
Nitrogenous compounds	2,5-Pyrrolidinedione, 1-methyl											✓	
	2-acetyl pyrrole											✓	✓
	Pyridine											✓	
	1H-Indole, 2,3-dimethyl-											✓	
	Pyridine, 4-propyl-											✓	
	Pyrazine, methyl-											✓	
	2,6-Dimethylphenyl isocyanate											✓	
	Pyrazine, 2-ethyl-3-methyl-											✓	
	2-Acetyl-1-methylpyrrole											✓	
	2,5-Pyrrolidinedione, 1-ethyl											✓	
	Pyridine, 2-methyl-											✓	
	1,3-Benzoxazol-4-ol											✓	
	Acetamide											✓	
	1H-Pyrrole-2-carboxaldehyde												✓
	1H-Pyrrole-2-carboxaldehyde, 1-methyl-												✓
	2-Acetoxymethylpyridine												✓
	4(1H)-Pyridinone, 2,3-dihydro-1-methyl-												✓
	3-(Furan-2-yl)-4-methyl-1,2,4-triazole												✓
	Acetamide, N-(2,4-dihydroxyphenyl)-												✓
	4-Hydroxy-6-(methylamino)pyrimidine												✓