

Chemo-enzymatic preparation and characterization of renewable oligomers with bisguaiaicol moieties: promising sustainable antiradical/antioxidant additives

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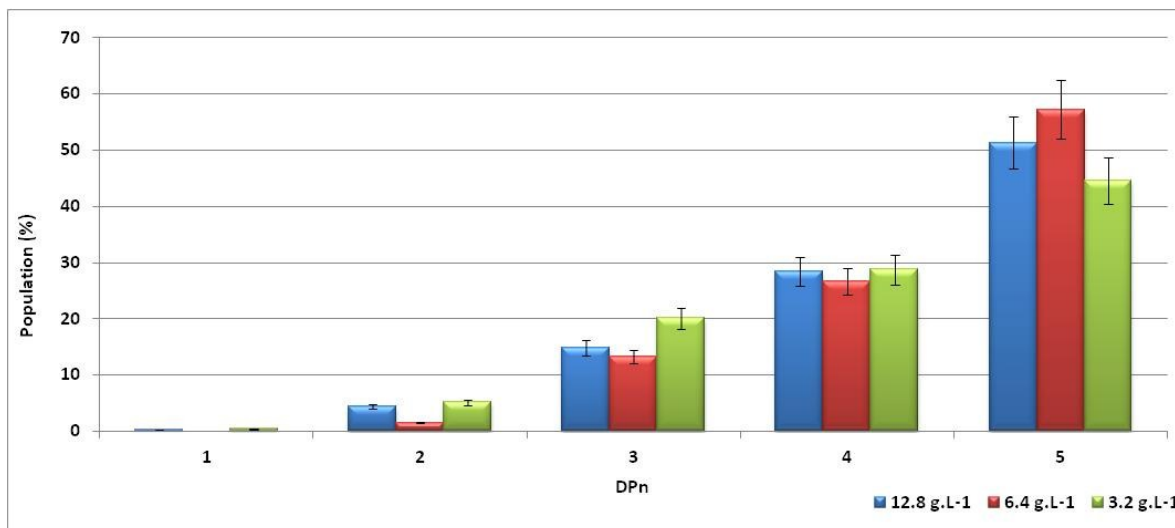
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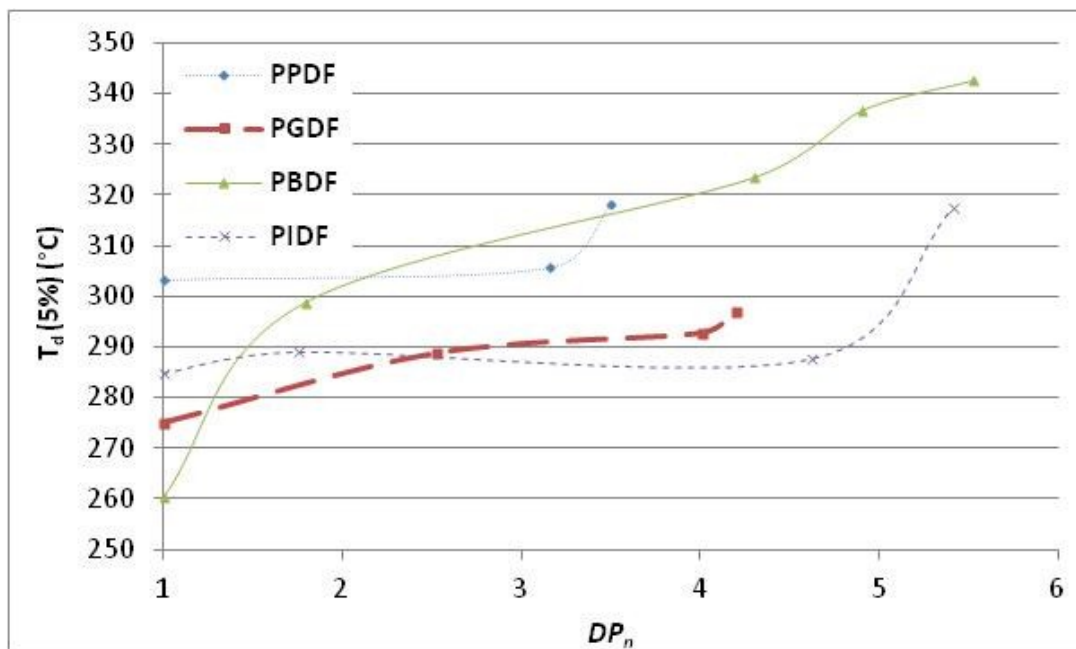
Co-solvent	Aqueous media	Volume ratio solvent/aqueous media	Temperature	Time reaction (hour)	Laccase loading (u/mmol)	Bisphenol	DP_n	PDI
EtOH	Milli-Q water	3 / 7	r.t.	120 h	100	PDF	3.7	1.4
			40 °C			PDF	4.9	1.4
			50 °C			PDF	2.8	1.1
			60 °C			PDF	2.3	1.0
	Buffer 4.2	2 / 8	r.t.		50	IDF	2.3	1.3
						GDF	2.3	1.2
						BDF	2.8	1.5
					4 / 6	10	PDF	3.2
		PDF	3.3				1.2	
		PDF	3.5				1.1	
		PDF	2.4				1.0	
		6 / 4	100		PDF	2.8	1.2	
					PDF	3.0	1.2	
					PDF	2.2	1.0	
					PDF	2.2	1.0	
		8 / 2	50		IDF	2.4	1.1	
					GDF	4.0	1.2	
					BDF	2.1	1.6	
					IDF	1.9	1.1	
		GDF			2.6	1.1		
		BDF			1.4	1.2		
		acetone	Buffer 4.2		3 / 7	r.t.	8	50
24	BDF			2.9			1.1	
48	BDF			5.5			1.1	
72	BDF			3.7			1.3	
96	BDF			5.0			1.1	
40 °C	120			2		IDF	1.8	1.1
				10		IDF	2.2	1.1
				50		IDF	2.4	1.1
				100		IDF	2.7	1.2
				1000		IDF	4.6	1.2
	50			BDF		4.9	1.1	
		GDF	2.9	1.2				
		IDF	2.9	1.2				
		IDF	2.4	1.1				
60 °C	GDF	4.3	1.2					
	BDF	4.4	1.4					
	IDF	2.0	1.1					
	GDF	2.1	1.1					
	BDF	1.3	1.1					

Table 1: Oligomers obtained depending on reaction conditions



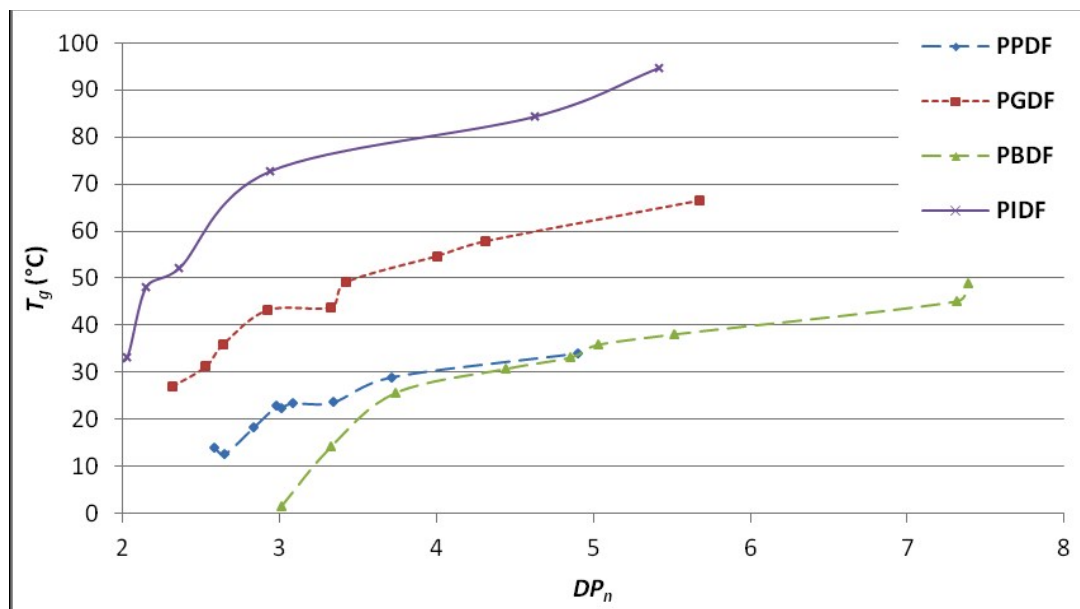
Conditions: 4.2 phosphate/citrate buffer:acetone (40:60), 50 U/mmol_{substrate}, r.t., 120 hours

Figure 1: GPC analysis of the oligomerization of BDF at different concentrations



Conditions: 10 °C/min under N₂ atmosphere

Figure 2: Temperature at 5% weight loss of oligomers determined by TGA



Conditions: 10 °C/min under N₂ atmosphere

Figure 3: T_g of oligomers determined by DSC