Supporting Information

Effective Enzymatic Synthesis of Lactosucrose and Its Analogues by β-D-Galactosidase from *Bacillus circulans*

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Table S1. ^{1}H and ^{13}C NMR Chemical Shifts (δ, ppm) and Coupling Constants (J, Hz) for **I–IV**

Position	^{13}C NMR, δ					^{1}H NMR, δ, *mult, J*				
	I	**II**	**IV**	**III**		**I**	**II**	**IV**	**III**	
Fructose										
1	61.7	61.6	61.3			3.72, s	3.71, s	3.75, s		
2	104.1	104.7	103.7							
3	76.8	76.7	76.4			4.13, d, 8.81	4.12, d, 8.70	4.20, d, 8.73		
4	74.4	74.5	74.0			3.97, d, 8.60	3.96, d, 8.50	4.03, d, 8.59		
5	81.8	81.9	81.4							
6	62.7	62.8	62.4							
Glucose				**α**	**β**				**α**	**β**
1′	92.3	92.4	91.9	92.2	96.1	5.32, d, 3.40	5.47, d, 3.30	5.39, d, 3.13	5.14, d, 3.54	4.58, d, 7.95
2′	71.1	71.5	70.7	71.8	74.2					
3′	71.6	79.6	71.4	71.8	74.8					
4′	78.5	69.6	78.1	78.9	78.8					
5′	71.5	72.6	71.2	70.5	74.9					
6′	59.9	60.5	59.5	60.5	60.3					
Galactose										
1″	103.3	104.3	102.9	103.3		4.39, d, 7.76	4.51, d, 7.74	4.49, d, 7.94	4.40, d, 7.81	
2″	71.4	72.2	71.0	71.5						
3″	73.0	73.0	72.8	73.2						
4″	69.0	69.1	77.2	77.5						
5″	75.8	75.6	75.1	75.2						
6″	61.4	61.5	61.0	61.1						
Galactose										
1‴			104.2	104.6				4.59, d, 7.59	4.52, d, 7.77	
2‴			71.4	71.8						
3‴			73.0	73.4						
4‴			68.6	69.0						
5‴			74.5	75.5						
6‴			60.7	61.4						

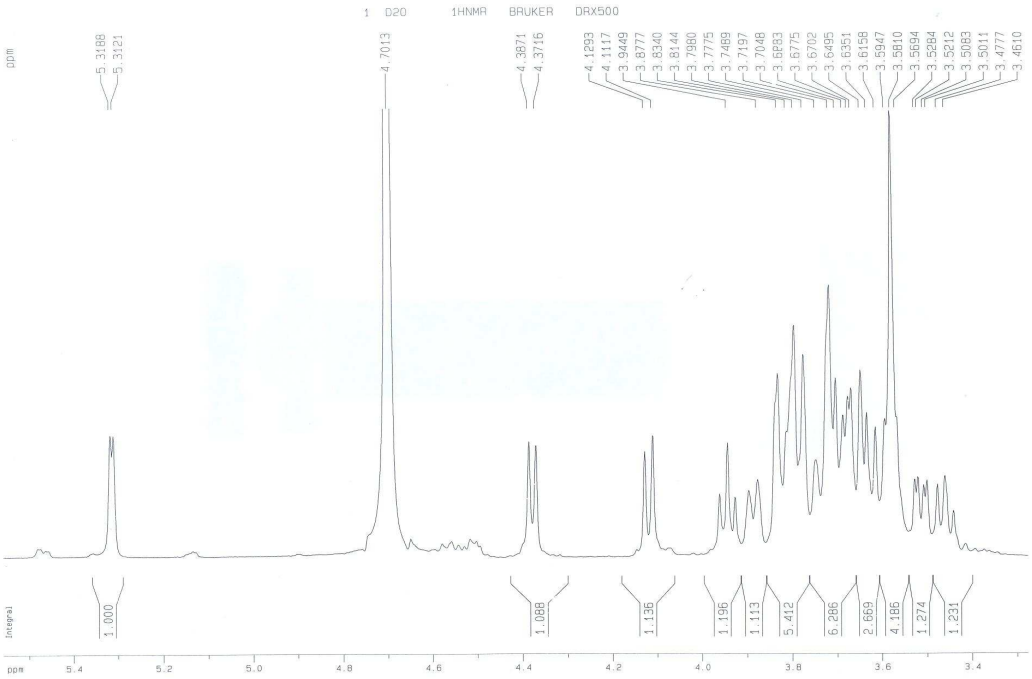

Figure S1a. ^{1}H NMR spectrum of **I**.

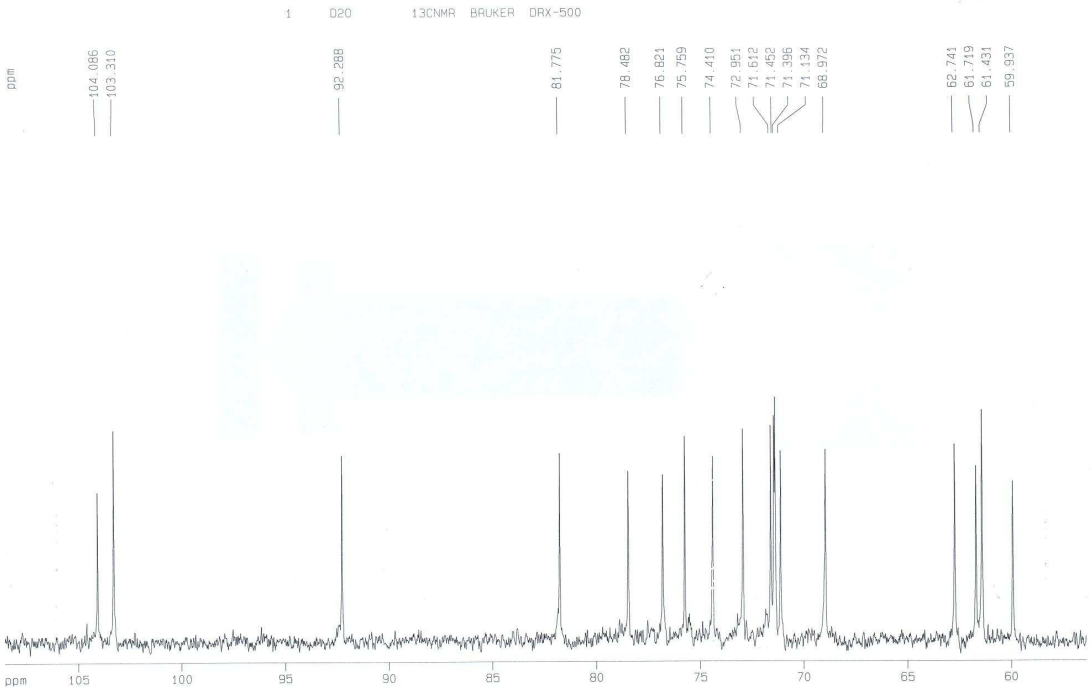

Figure S1b. ^{13}C NMR spectrum of **I**.

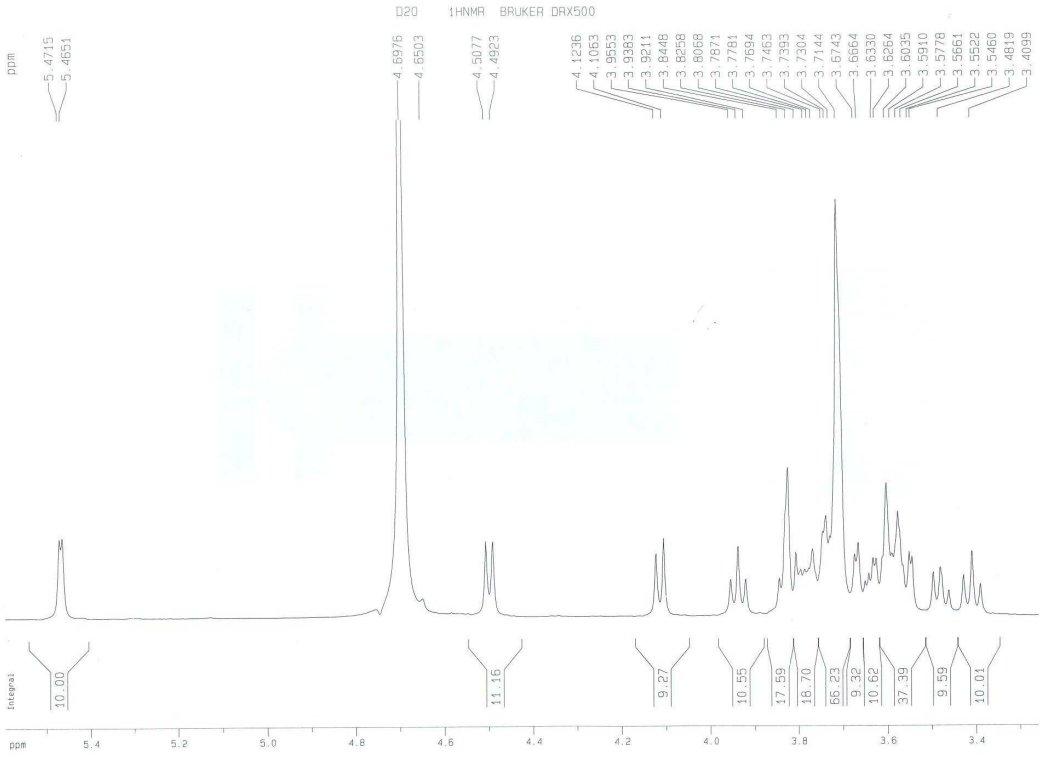

Figure S2a. ^{1}H NMR spectrum of **II**.

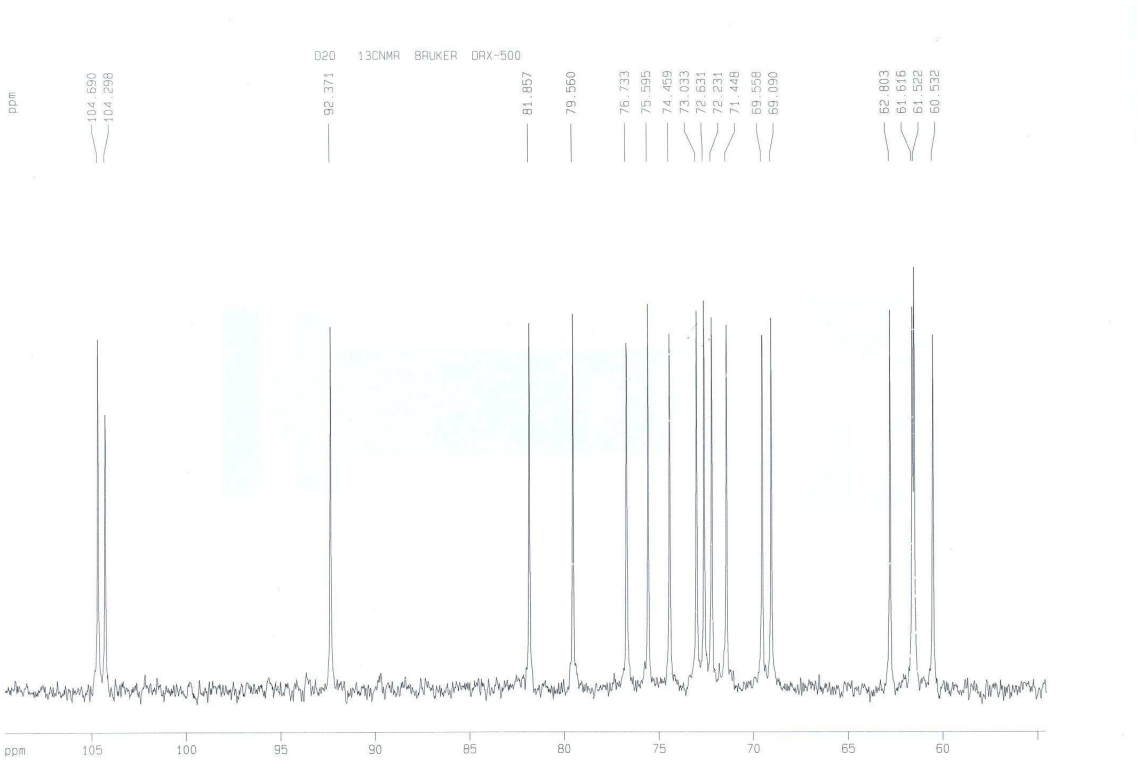

Figure S2b. ^{13}C NMR spectrum of **II**.

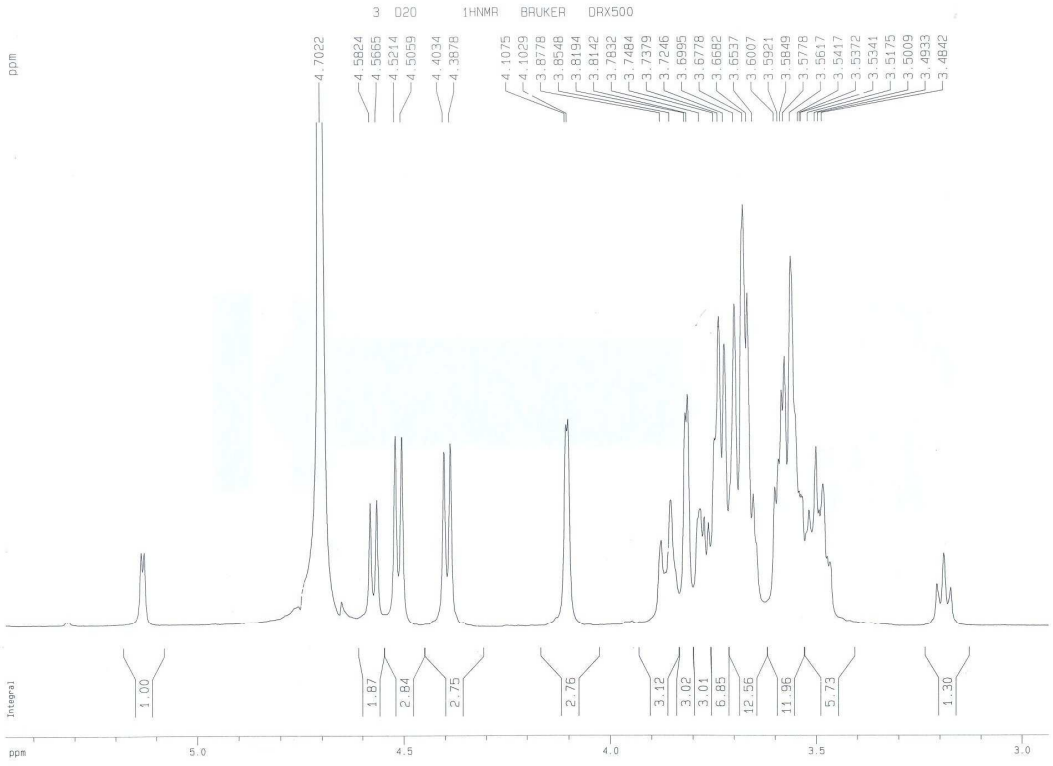

Figure S3a. ^{1}H NMR spectrum of **III**.

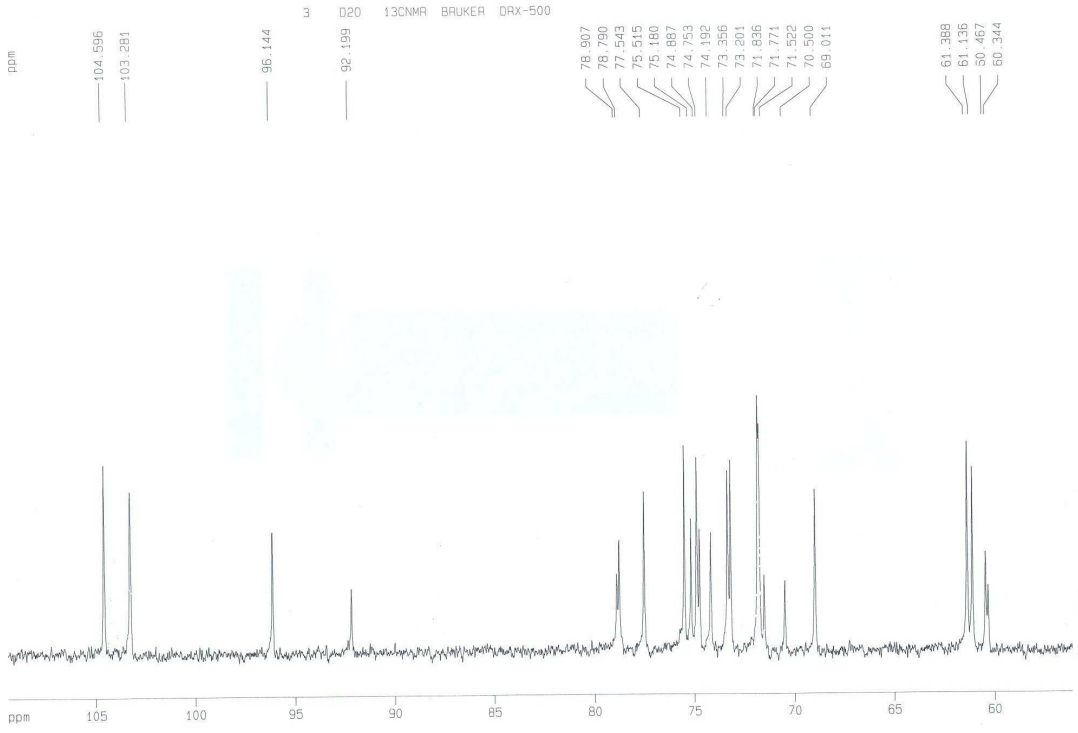

Figure S3b. ^{13}C NMR spectrum of **III**.

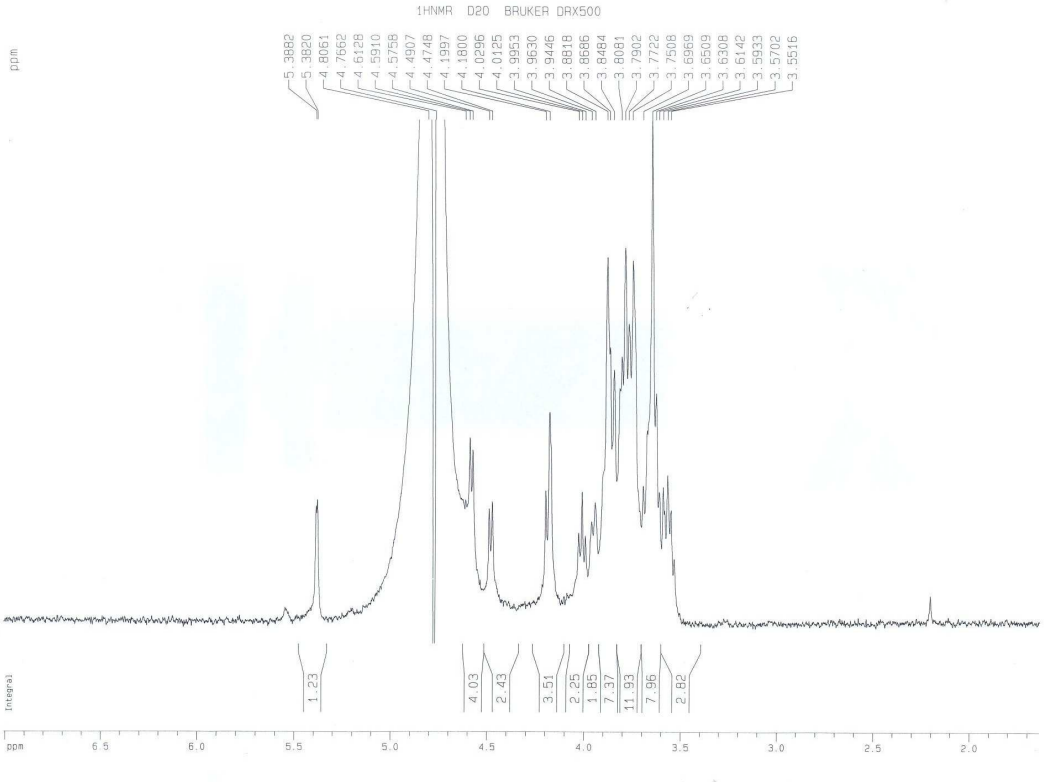

Figure S4a. ^{1}H NMR spectrum of **IV**.

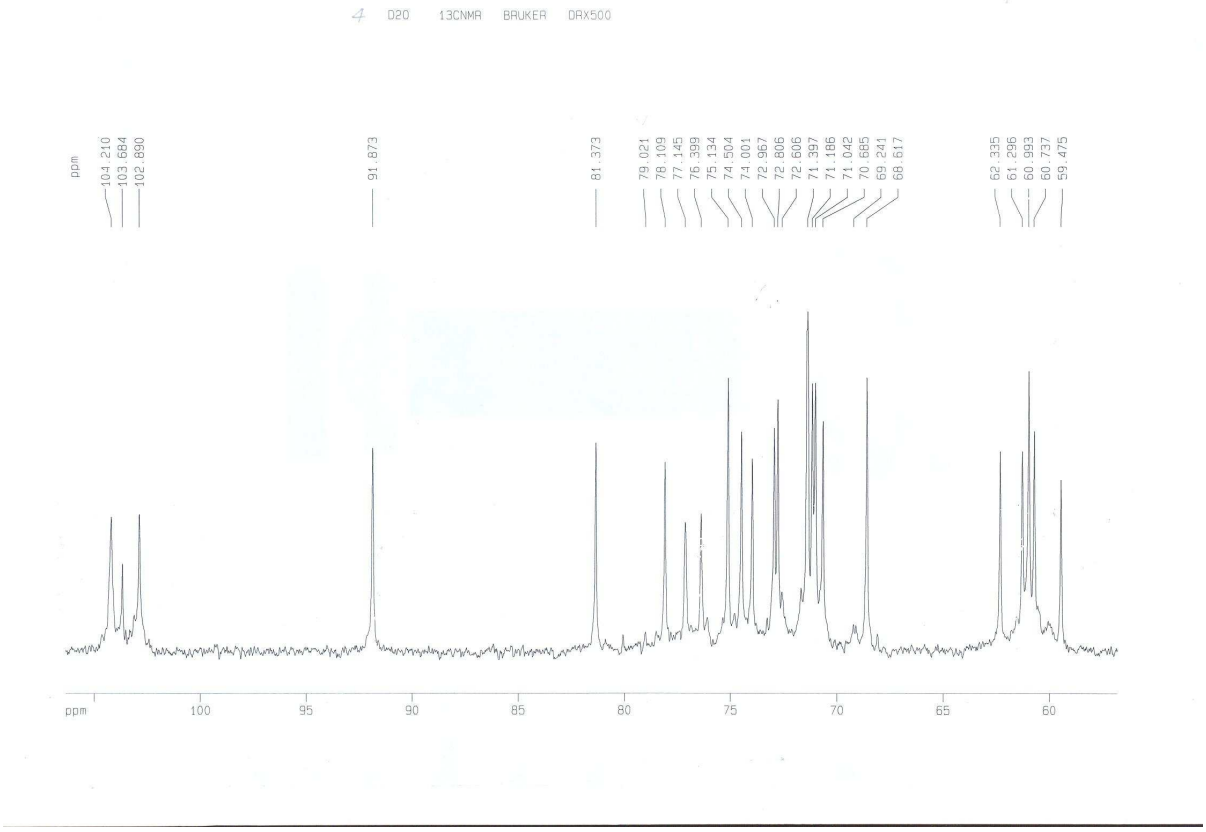

Figure S4b. ^{13}C NMR spectrum of **IV**.

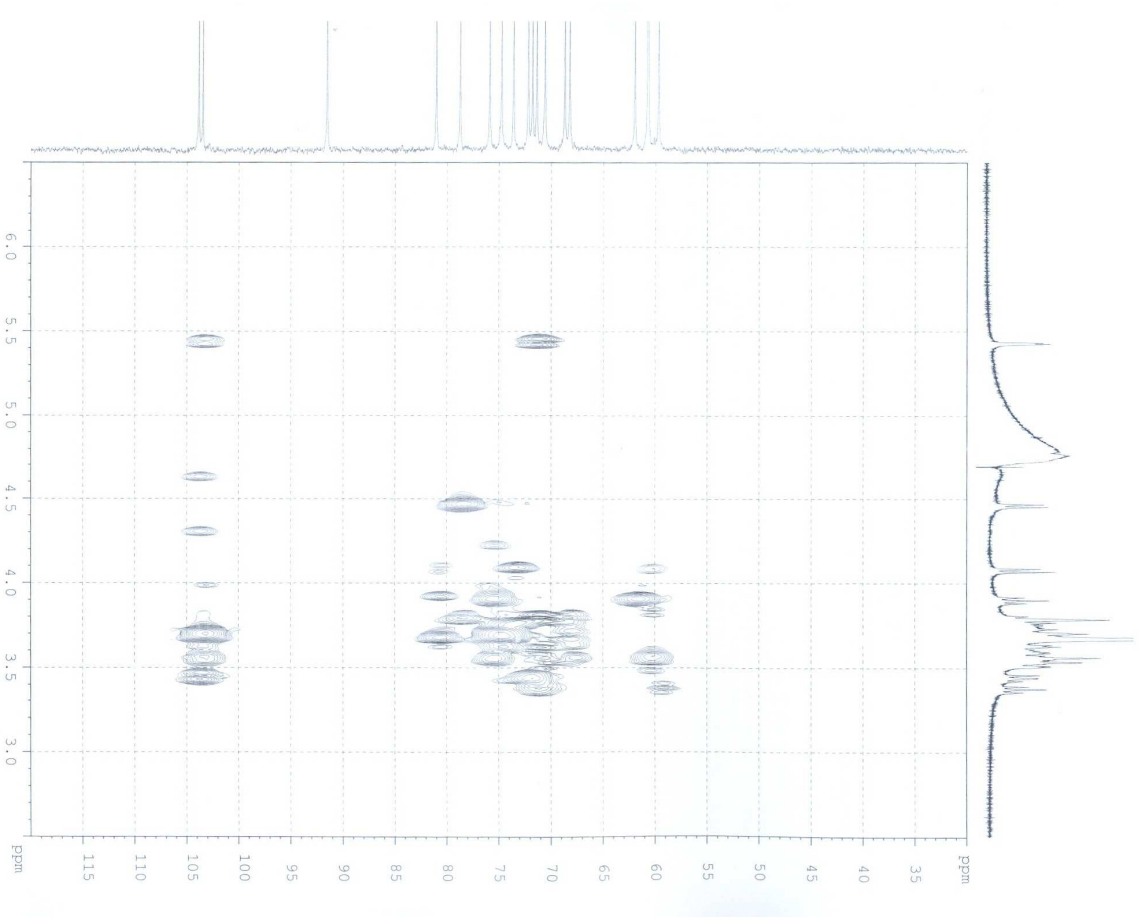

Figure S5. Two dimensional HMBC spectrum of **II**