

Comparative Study of Green and Traditional Routes for Cellulose Extraction from a Sugarcane by-product

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A contribution from

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Table S1 – FT-IR vibration bands assignments for all products obtained from different cellulose extraction methods applied to sugarcane bagasse.

Wavenumber (cm ⁻¹)	Assignments	Samples
830	C–H stretching in lignin aromatic rings [1]	SCB, AuH, ELa1:2, AcH SCB>315, AuH_170, AuH_180, AuH_190, EtOH
900	C-H rocking in cellulose (β-glycosidic linkages) [2]	All
1030	C–O stretching in cellulose [1]	All
1060		CC, AuH AuH_170, AuH_180, AuH_190, Au_EtOH
1110	C-O-C ring stretching in cellulose [3]	CC, AuH, ELa1:2 AuH_170, AuH_180, AuH_190, Au_EtOH
1160		All
1250	C-O stretching of guaiacyl ring in lignin [4]	SCB, ELa1:2, AcH SCB>315, EtOH
1370	C-H and C–O bending in aromatic rings of polysaccharides [5]	All
1430	CH ₂ bending associated with crystalline cellulose [1]	All
1500	C=C stretching of aromatic ring in lignin [6]	All
1600-1640	O–H bending due to adsorbed water in cellulose [3]	All
1730	C=O stretching vibration of the acetyl and ester linkages in lignin and hemicellulose [2]	SCB, ELa1:2, AcH SCB>315, EtOH
2850	CH ₂ bending associated with hemicellulose [7]	SCB, ELa1:2, AcH, AlkH SCB>315
2900	C-H stretching in cellulose [6]	All
3200-3400	O-H stretching of intramolecular hydrogen bonds in cellulose [8]	All

Legend: CC: commercial cellulose; SCB: untreated sugarcane bagasse; AuH: fraction extracted by autohydrolysis; ELa1:2: fraction extracted by DES with choline chloride and lactic acid (ratio 1:2); AlkH: fraction extracted by alkaline hydrolysis; AcH: fraction extracted by acid hydrolysis; SCB>315: untreated sugarcane bagasse fraction superior to 315 μm; AuH_EtOH: fraction extracted by autohydrolysis followed by organosolv with ethanol; EtOH: fraction extracted by organosolv with ethanol; AuH_190: fraction extracted by autohydrolysis at 190 °C; AuH_180: fraction extracted by autohydrolysis at 180 °C; AuH_170: fraction extracted by autohydrolysis at 170 °C.

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