Supplementary information

Table 1. Main values of lignin peaks observed by FTIR

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| --- | --- |
| Wavenumber | identification |
| 3460-3412 | OH stretching |
| 2935-2848 | C-H stretching in CH3 and CH2 groups |
| 1738-1709 | Non-conjugated C=O stretching of ketones and esters |
| 1675-1645 | Stretching of conjugated C=O |
| 1605-1593 | Aromatic ring vibration and C=O stretching; S > G |
| 1515-1505 | Vibration of aromatic rings, G > S |
| 1470-1460 | Asymmetric C-H deformation in CH3 and CH2 |
| 1430-1422 | Aromatic skeletal vibrations combined with C-H in-plane deformation |
| 1370-1365 | Stretching of aliphatic C-H in CH3, OH phenolic deformation |
| 1330-1325 | Vibration of the syringyl ring with C-O stretching |
| 1270-1266 | Vibration of the guaiacyl ring; C=O stretching |
| 1230-1221 | Stretching of C-C, C-O and C=O, C-H stretching in syrringyl units |
| 1140 | Plane deformation of aromatic C-H in guaiacyl |
| 1128-1125 | Plane deformation of the aromatic C-H of guaiacyl |
| 1086 | C-O deformation of secondary alcohols and aliphatic ethers |
| 1035-1030 | Plane deformation of aromatic C-H, deformation of C-O in primary alcohols, stretching of C=O |
| 925-915 | Out-of-plane deformation of aromatic C-H |
| 970 | Deformation of C-C in CH=CH |
| 858-853 | Out-of-plane deformation of C-H in positions 2,5 and 6 of guaiacyl |
| 830-815 | Out-of-plane deformation of C-H in positions 2,5 and 6 of guaiacyl, C-H deformation of aromatic ring syringyle |

Table 2. minerals in lignin analyzed by ICP-OES

|  |  |  |
| --- | --- | --- |
| **minerals** | **Red Oak** | **Sugar maple** |
| Ca (ppm) | 1697 | 133 |
| Fe (ppm) | 1761 | 1606 |
| K (ppm) | 97.6 | 34.9 |
| Mg (ppm) | 7.97 | 12 |
| Na (ppm) | 29.9 | 14 |
| P (ppm) | 51.8 | 22 |
| Zn (ppm) | 1 | 2 |

Table 3. minerals in barks analyzed by ICP-OES

|  |  |  |
| --- | --- | --- |
| **minerals** | **Red Oak** | **Sugar maple** |
| Ca (ppm) | 13786 | 13768 |
| Fe (ppm) | 26.63 | 39.38 |
| K (ppm) | 687.9 | 1348 |
| Mg (ppm) | 189.8 | 477.6 |
| Na (ppm) | 106 | 203.9 |
| P (ppm) | 99.6 | 184.4 |
| Zn (ppm) | 3.45 | 18.44 |

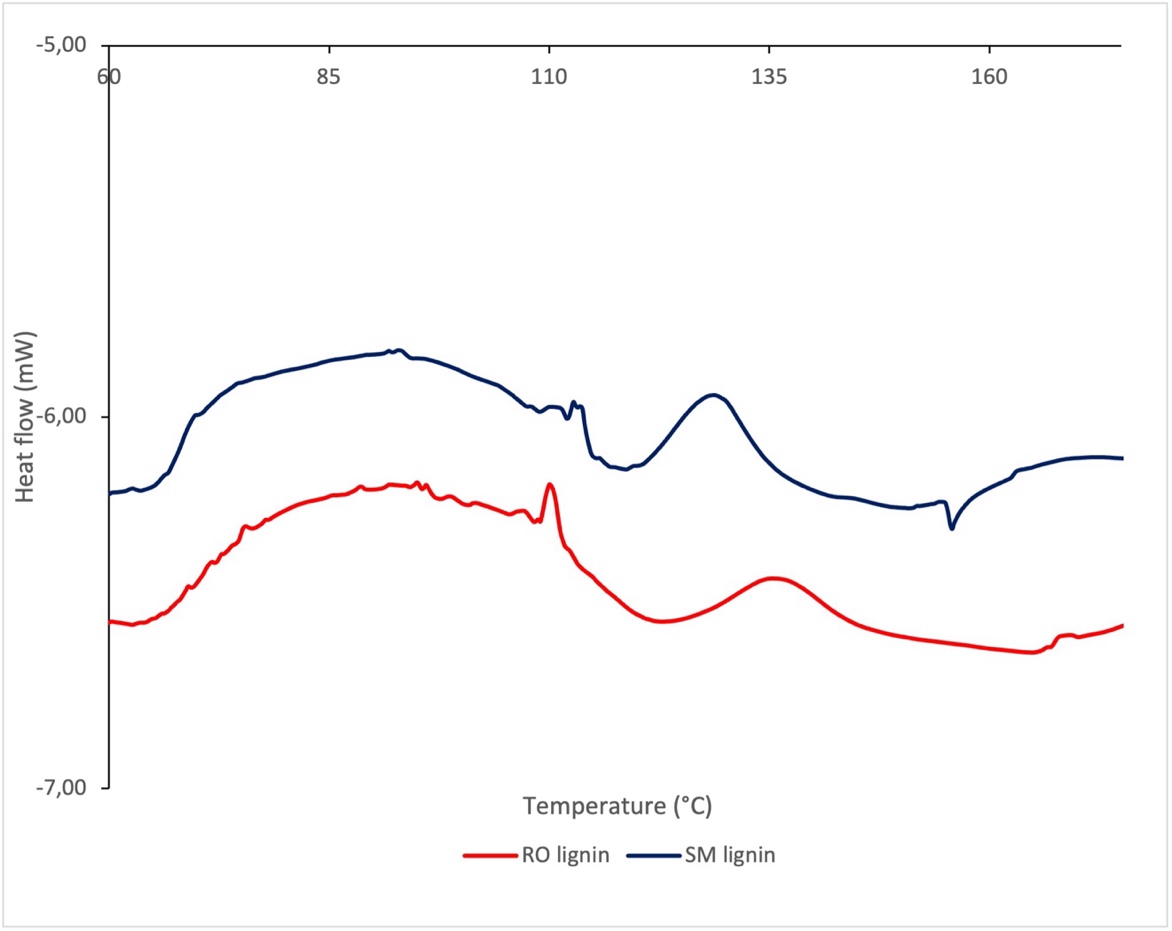


Figure 1. DSC heating curveof Organosolv lignins from SM and RO barks.

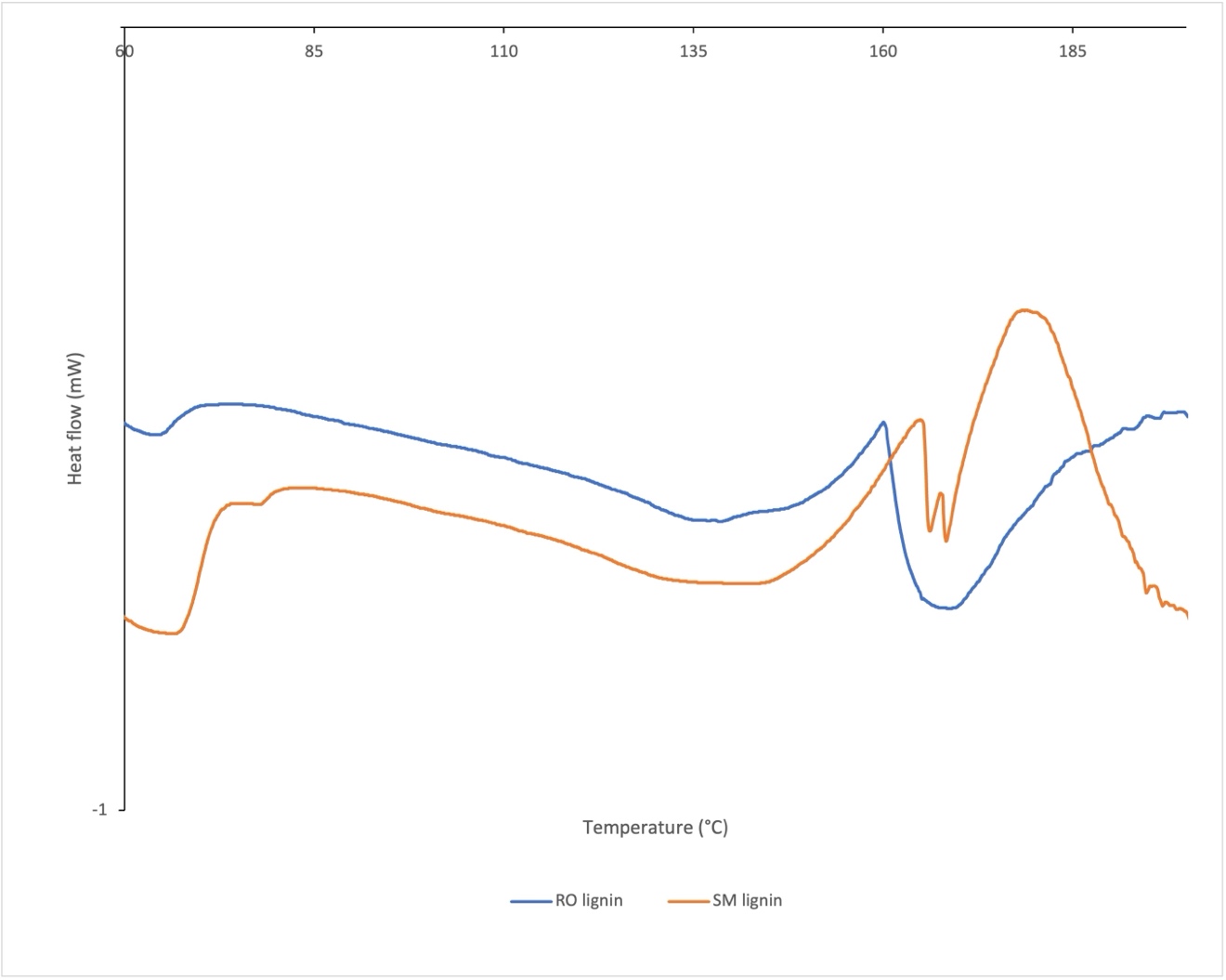


Figure 2. DSC heating curveof Dioxane lignins from SM and RO barks.