**Supplementary material**

*Acid hydrolysis of lignocellulosic biomass: sugars and furfurals formation*

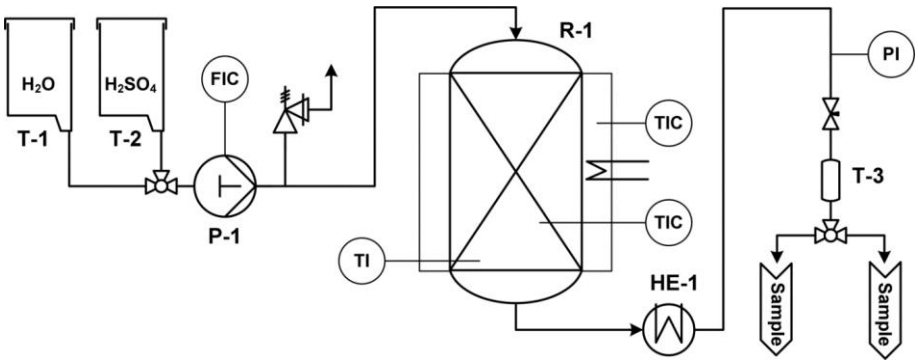


**Figure S1.** Process flow diagram of the mini plant for the fractionation of biomass. T – 1, 2: feedstock tanks, P – 1: pump, R – 1: fixed bed reactor with surrounding heating block, T – 3: small tank.

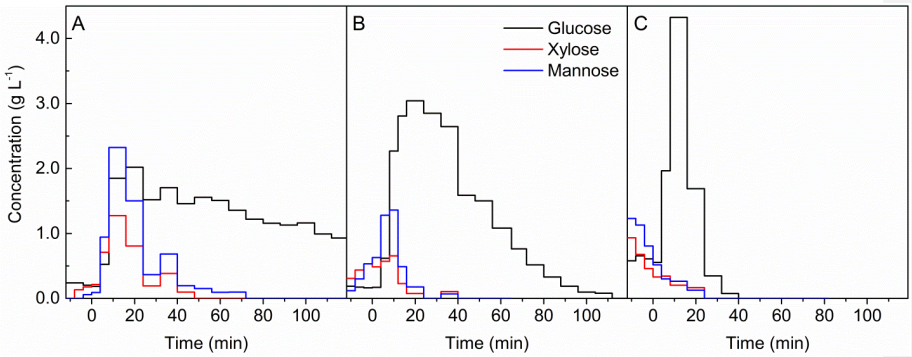


**Figure S2.** Formation of sugars in the hydrolysis of spruce wood, at (A) 180 °C, (B) 200 °C, (C) 220 °C temperature with 0.05 mol $L^{-1}$ sulphuric acid, t = 0 min marks the beginning of acid hydrolysis.

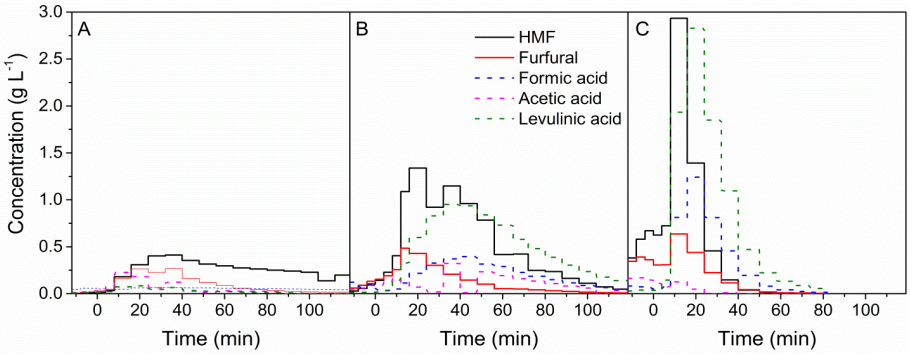


**Figure S3.** Formation of furfurals and organic acids in the hydrolysis of spruce wood, at (A) 180 °C, (B) 200 °C, (C) 220 °C temperature with 0.05 mol $L^{-1}$ sulphuric acid, t = 0 min marks the beginning of acid hydrolysis.

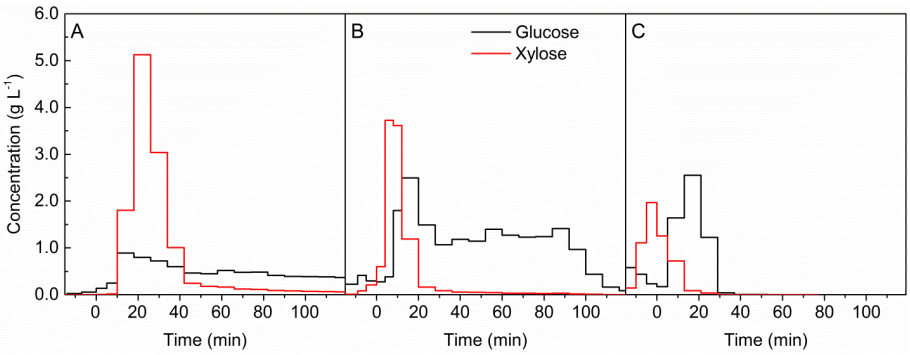


**Figure S4.** Formation of sugars in the hydrolysis of *Miscanthus x giganteus*, at (A) 180 °C, (B) 200 °C, (C) 220 °C temperature with 0.05 mol $L^{-1}$ sulphuric acid, t = 0 min marks the beginning of acid hydrolysis.

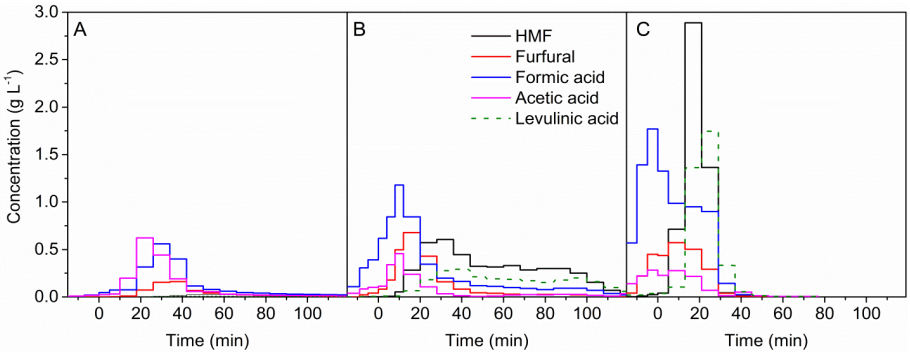


**Figure S5.** Formation of furfurals and organic acids in the hydrolysis of *Miscanthus x giganteus*, at (A) 180 °C, (B) 200 °C, (C) 220 °C temperature with 0.05 mol $L^{-1}$ sulphuric acid, t = 0 min marks the beginning of acid hydrolysis.

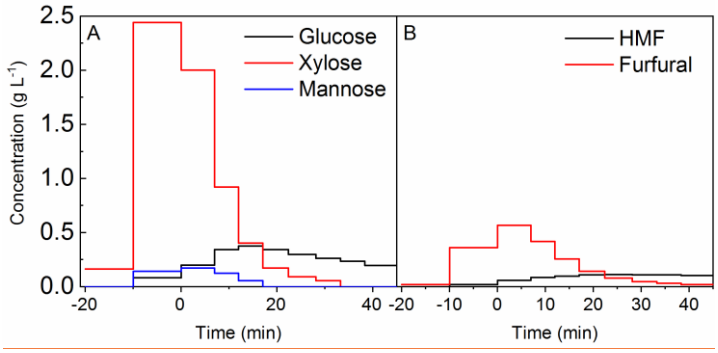


**Figure S6.** Formation of (A) sugars and (B) furfurals in the hydrolysis of beech wood, at 220 °C temperature without acid catalyst.

**Table S1.** Main components yield after beech wood hydrolysis with 0.05 mol $L^{-1}$ sulphuric acid at 180, 200, and 220 °C.

| | Yield (mg g-1 dry biomass) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 180 °C | | | 200 °C | | | 220 °C | |
| time (min) | 20 | 40 | 60 | 20 | 40 | 60 | 20 | |
| Glucose | 21.7 | 72.6 | 79.2 | 68.5 | 148.0 | 176.0 | 121.1 | 126.3 |
| Xylose | 66.9 | 80.3 | 80.6 | 41.4 | 42.0 | 42.0 | 7.3 | 7.3 |
| Mannose | 4.4 | 7.4 | 7.8 | 6.2 | 15.1 | 17.6 | 9.3 | 10.4 |
| HMF | 0.7 | 4.3 | 8.8 | 8.3 | 30.2 | 39.9 | 30.2 | 34.5 |
| Furfural | 5.1 | 10.3 | 11.3 | 11.5 | 16.8 | 17.9 | 9.9 | 12.1 |
| Formic acid | 1.0 | 1.5 | 1.9 | 2.5 | 10.6 | 15.5 | 12.2 | 21.4 |
| Acetic acid | 13.2 | 16.0 | 16.2 | 15.0 | 17.1 | 17.3 | 4.7 | 5.0 |
| Levulinic acid | 1.0 | 1.2 | 1.2 | 1.8 | 20.1 | 31.2 | 26.2 | 44.8 |

**Table S2.** Main components yield after miscanthus hydrolysis with 0.05 mol $L^{-1}$ sulphuric acid at 180, 200, and 220 °C.

| | Yield (mg $g^{-1}$ dry biomass) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 180 °C | | | 200 °C | | | 220 °C | | |
| time (min) | 20 | 40 | 60 | 20 | 40 | 60 | 20 | 40 | 60 |
| Glucose | 15.6 | 33.2 | 46.5 | 31.1 | 70.7 | 110.0 | 38.2 | 56.1 | 56.3 |
| Xylose | 57.5 | 98.2 | 104.7 | 57.3 | 60.8 | 62.4 | 14.9 | 15.4 | 15.4 |
| HMF | 0.0 | 1.1 | 1.1 | 2.2 | 19.8 | 30.6 | 34.0 | 54.1 | 54.2 |
| Furfural | 1.0 | 5.1 | 6.8 | 9.0 | 18.5 | 18.5 | 12.1 | 16.6 | 16.7 |
| Formic acid | 4.8 | 15.8 | 18.8 | 21.9 | 29.7 | 33.6 | 25.8 | 39.1 | 39.6 |
| Acetic acid | 7.2 | 13.9 | 15.6 | 7.2 | 9.0 | 9.3 | 5.7 | 7.0 | 7.3 |
| Levulinic acid | 0.0 | 0.3 | 0.5 | 0.6 | 8.2 | 15.0 | 14.5 | 40.2 | 40.8 |