

## Supplementary Information

### Non-Stoichiometric Formation of Formic and Levulinic Acids from the Hydrolysis of Biomass Derived Hexose Carbohydrates

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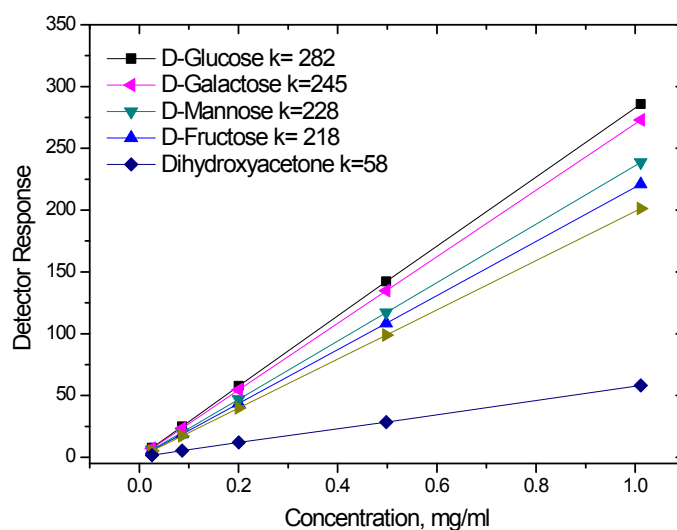
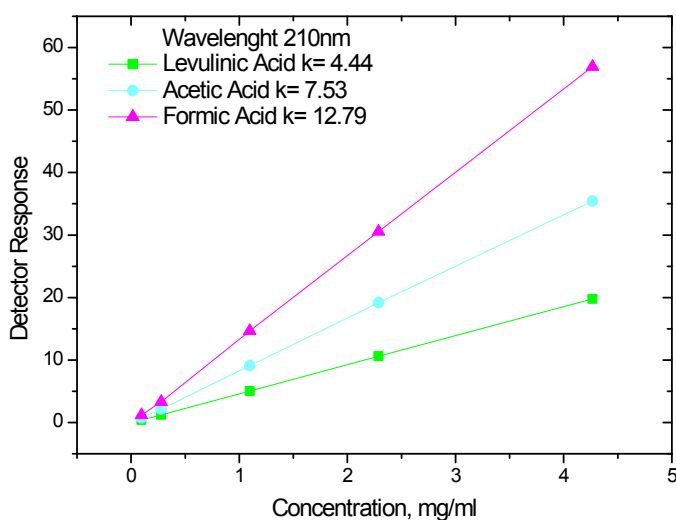
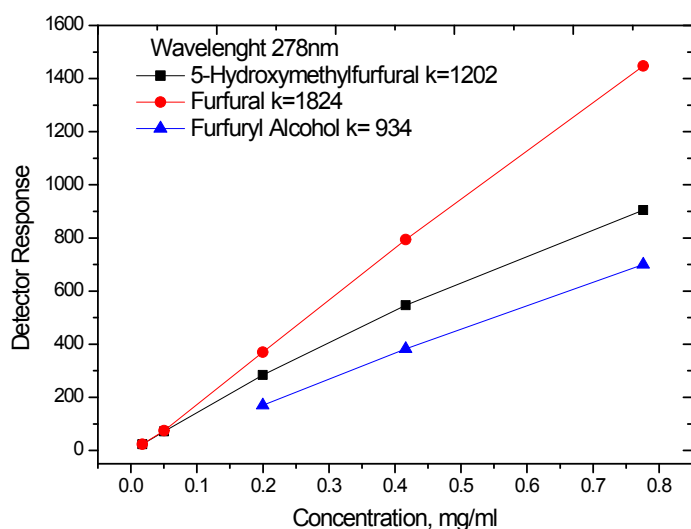
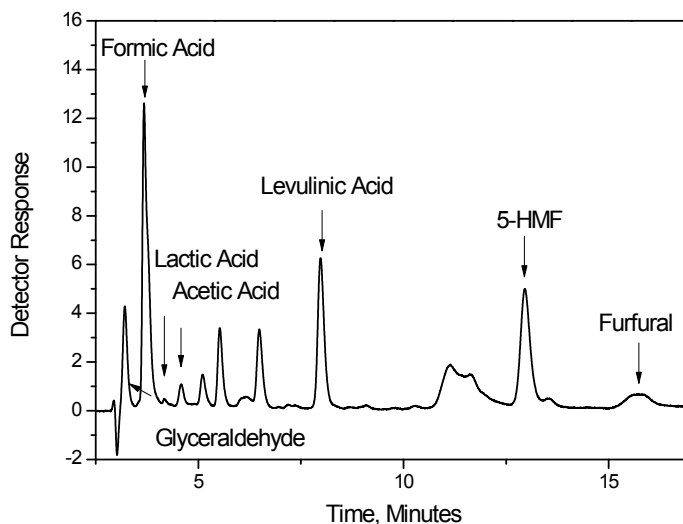


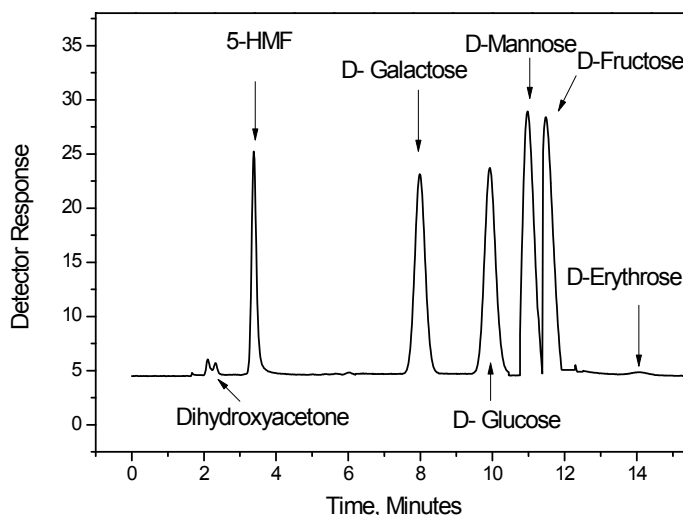
Figure S11. Detector response for carbohydrates and their derivatives using the Carbopac™ PA1 column.



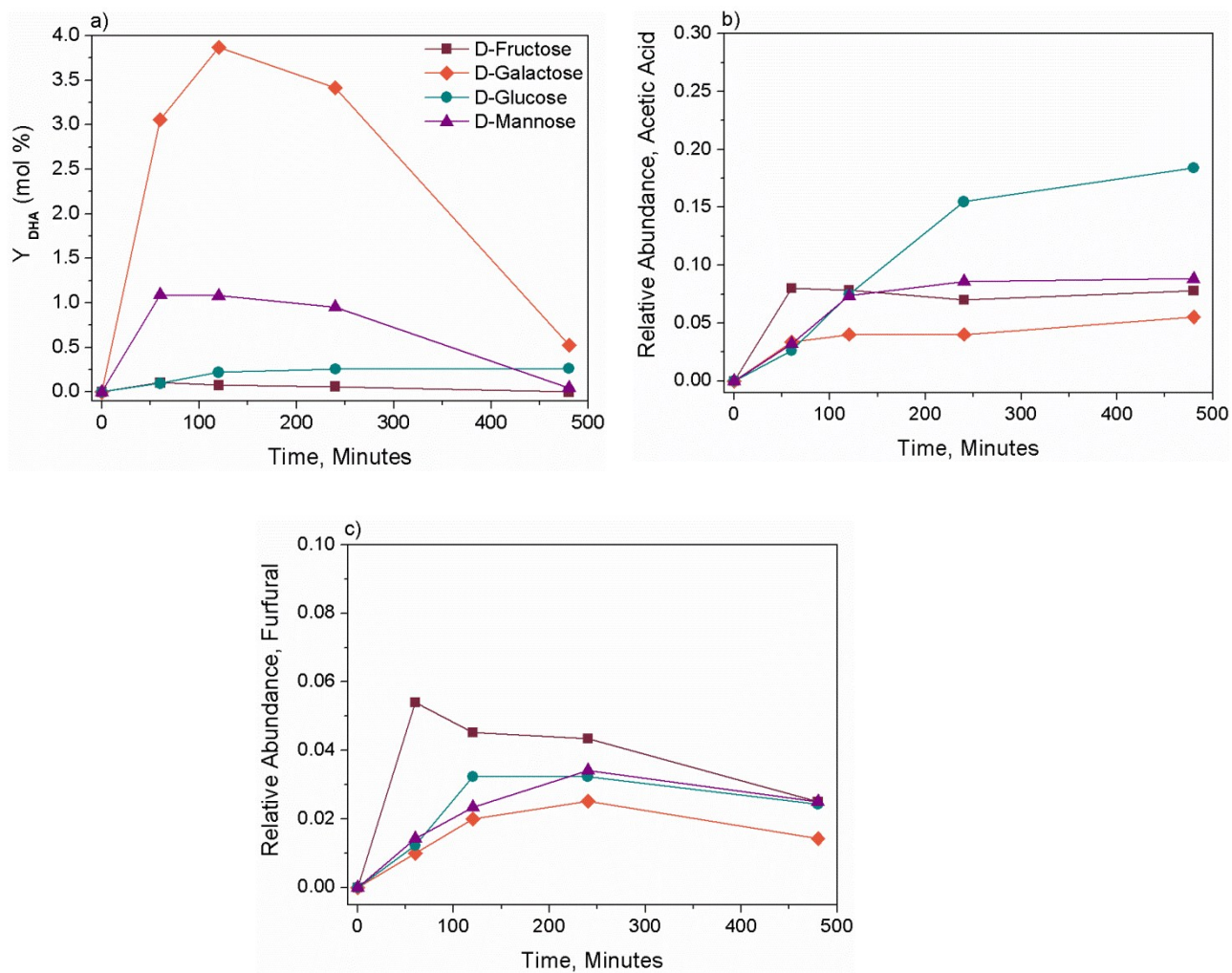
**Figure S12:** Detector response for compounds of interest using the Dionex Acclaim® Organic Acid column.



**Figure S13:** Typical chromatogram from the acid catalysed degradation of hexose sugars using an Acclaim® Organic Acid column. Note formic acid is calibrated by height; all other compounds are calibrated by area.



**Figure S14:** Typical chromatogram from the acid catalysed degradation of hexose sugar using a PA1 Dionex CarboPac PA1 carbohydrate column.



**Figure S15.** Molar yields of dihydroxyacetone (a), the relative abundance of acetic acid (b) and the relative abundance of furfural (c) detected for all model hexose carbohydrates.