

Clean H₂ production by lignin-assisted electrolysis in a polymer electrolyte membrane flow reactor

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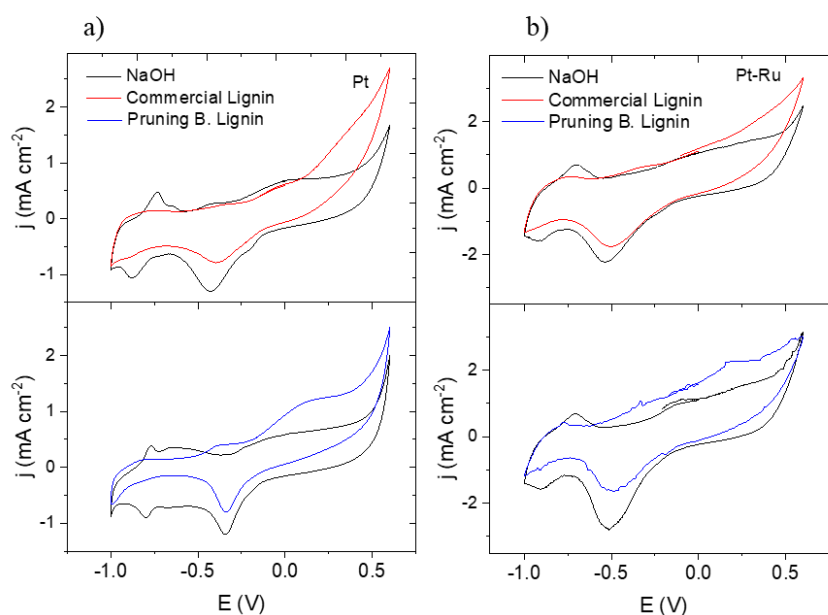


Figure S1: Cyclic Voltammeteries comparison between lignin material and the NaOH solution, 50 mV s^{-1} , 60°C ; a) Pt catalyst at 0.11 mg cm^{-2} , b) Pt-Ru catalyst at 0.12 mg cm^{-2} .

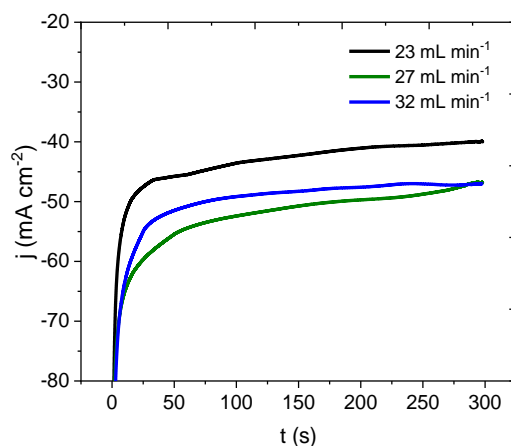


Figure S2: Chronoamperometries of Pruning B. Lignin at 6 g L^{-1} , Pt-Ru 0.09 mg cm^{-2} , -2.3 V , 300 s ; at different fluxes: 23 , 27 and 32 mL min^{-1} .

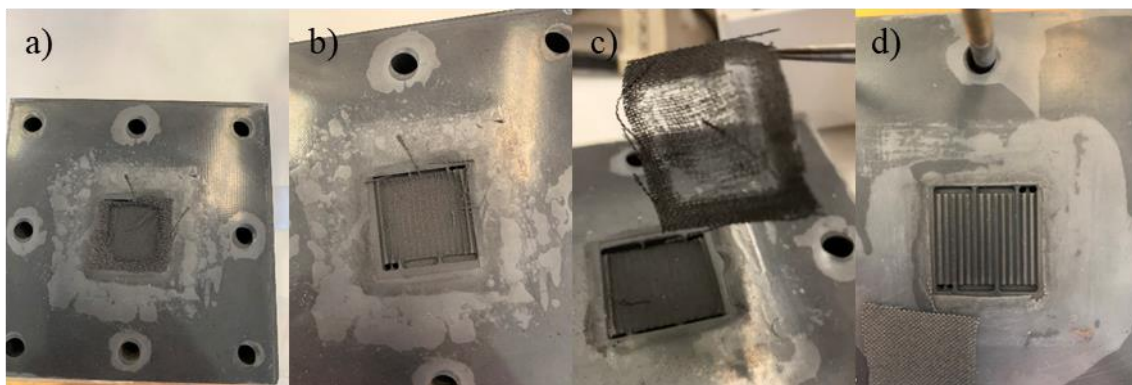


Figure S3: Graphite bipolar plates; a) separator cloth and bipolar plate from the anode degraded, b) anode plate degraded, c) separator cloth and bipolar plate from the anode degraded, d) separator cloth and bipolar plate from the cathode.

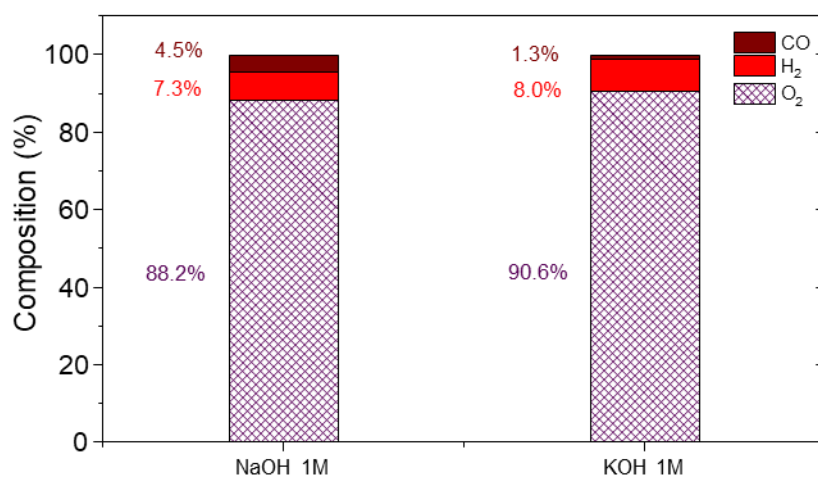


Figure S4: Gas composition with different electrolytes, -100 mA cm^{-2} , Pt at 0.08 mg cm^{-2} . 2 measurements for each quantification. Standard deviations are not showed in the graph for clarity, average obtained values are below 10% of error in the quantification of CO₂, CO, H₂ and O₂.

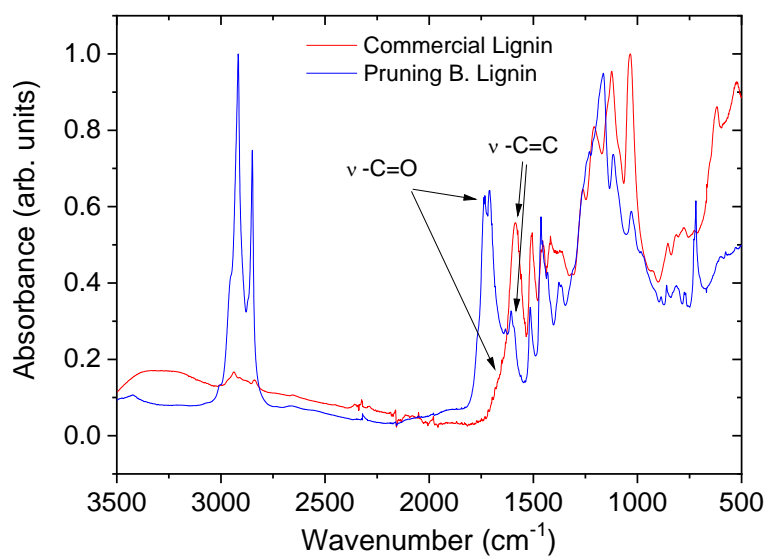


Figure S5: Commercial and Pruning B. Lignin IR spectra of dry products.