Revisiting the Brønsted acid catalysed hydrolysis kinetics of polymeric carbohydrates in ionic liquids by in situ ATR-FTIR spectroscopy

A new versatile method to measure rates and determine activation energies for the Brønsted acid catalysed hydrolysis of cellulose and cellobiose (and other polymeric carbohydrates) in ionic liquids is demonstrated by following the C–O stretching band of the glycoside bond with in situ ATR-FTIR. An activation energy in excellent agreement with the literature was determined for cellulose hydrolysis, whereas a distinctly lower activation energy was determined for cellobiose hydrolysis. The methodology also allowed to independently determine activation energies for the formation of 5-hydroxymethylfurfural in the systems.

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