US008236973B2

(12) **United States Patent**
Liu et al.

(10) **Patent No.: US 8,236,973 B2**
(45) **Date of Patent: Aug. 7, 2012**

(54) **ADSORPTION SEPARATION PROCESSES FOR IONIC LIQUID CATALYTIC PROCESSES**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 370 days.

(21) Appl. No.: **12/756,916**

(22) Filed: **Apr. 8, 2010**

(65) **Prior Publication Data**

US 2011/0105770 A1 May 5, 2011

Related U.S. Application Data

(60) Provisional application No. 61/258,347, filed on Nov. 5, 2009.

(51) **Int. Cl.**

C07D 307/42	(2006.01)
C07D 307/45	(2006.01)
C07D 493/04	(2006.01)

(52) **U.S. Cl.** **549/488**; 549/464

(58) **Field of Classification Search** 549/464, 549/488

See application file for complete search history.

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(57) **ABSTRACT**

Presently disclosed are methods and apparatus for separation of reaction products from reaction mixtures in an ionic liquid catalysis process, particularly in conversion of biomass, cellulose, and sugars into chemical intermediates such as 5-hydroxymethylfurfural (HMF). In one embodiment an ion exclusion adsorption mechanism is used for the separation process. The process comprises (i) mixing the ionic liquid-containing reaction mixture with de-ionized water, (ii) flowing the water solution mixture into an adsorption column, (iii) eluting the column with a water- and/or alcohol-based fluid, and (iv) collecting separated fractions at different elution times.

26 Claims, 15 Drawing Sheets