



(51) International Patent Classification:

C07C 15/08 (2006.01) *B01J 20/18* (2006.01)
C07C 15/067 (2006.01) *B01J 19/24* (2006.01)

(21) International Application Number:

PCT/US2012/033415

(22) International Filing Date:

13 April 2012 (13.04.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

13/092,326 22 April 2011 (22.04.2011) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

27 December 2012

(54) Title: RECYCLE OF TRANSALKYLATION EFFLUENT FRACTIONS ENRICHED IN TRIMETHYLBENZENE

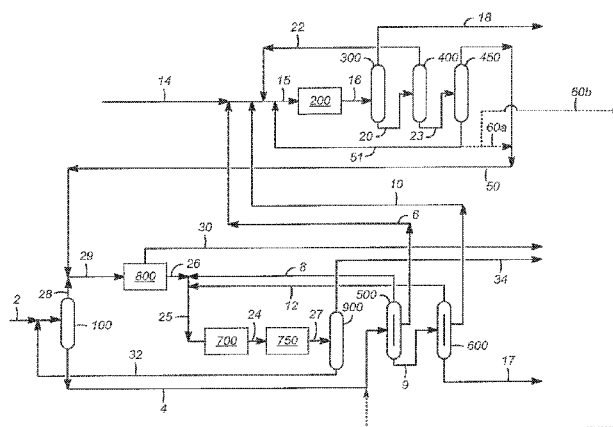


FIG. 1

(57) Abstract: Methods are disclosed for producing C₈ aromatic hydrocarbons. Representative methods comprise fractionating a transalkylation effluent, exiting a transalkylation reaction zone and comprising C₈ and C₉ aromatic hydrocarbons, to provide a C₈ aromatic hydrocarbon-enriched fraction and a C₉ aromatic hydrocarbon-enriched fraction. The methods may further comprise (i) recycling the C₉ aromatic hydrocarbon-enriched fraction to the transalkylation reaction zone and/or (ii) separating, in a xylene separation zone, isomers of C₈ aromatic hydrocarbons in the C₈ aromatic hydrocarbon-enriched fraction, into a para-xylene-enriched extract and a para-xylene-depleted raffinate. Performance in the transalkylation reaction zone is improved and/or downstream processing requirements in an aromatics complex are mitigated.

A. CLASSIFICATION OF SUBJECT MATTER*C07C 15/08(2006.01)i, C07C 15/067(2006.01)i, B01J 20/18(2006.01)i, B01J 19/24(2006.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

C07C 15/08; C07C 6/00; C07C 5/22; C07C 5/52; C10G 35/06; C07C 5/10

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: transalkylation, fractionat*, recycl*, divided wall distill*, paraxylene.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 7304193 B1 (FREY, STANLEY J. et al.) 04 December 2007 See Figure; column 4, lines 25-41; column 6, lines 21-65.	1,4-7,10 2-3
X A	US 6528695 B1 (MAGNE-DRISCH, JULIA et al.) 04 March 2003 See Figure; column 8, line 66-column 9, line 46.	1,5-7,10 2-4
X A	US 6355852 B1 (BRICKER, MAUREEN L. et al.) 12 March 2002 See column 4, lines 8-21.	1,5-6 2-4,7,10
A	US 2008-0051615 A1 (STAVENS, ELIZABETH L. et al.) 28 February 2008 See Figure 1; claim 38.	1-7,10
A	US 5952536 A (NACAMULI, GERALD J. et al.) 14 September 1999 See Figure 4; column 15, lines 7-19.	1-7,10



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

30 OCTOBER 2012 (30.10.2012)

Date of mailing of the international search report

31 OCTOBER 2012 (31.10.2012)

Name and mailing address of the ISA/KR

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Facsimile No. 82-42-472-7140

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/033415

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 7304193 B1	04.12.2007	None	
US 6528695 B1	04.03.2003	FR 2795406 A1 FR 2795406 B1	29.12.2000 29.11.2002
US 6355852 B1	12.03.2002	US 6593504 B1	15.07.2003
US 2008-0051615 A1	28.02.2008	US 7563358 B2	21.07.2009
US 5952536 A	14.09.1999	AU 1999-31997 A1 WO 99-51551 A1	25.10.1999 14.10.1999

INTERNATIONAL SEARCH REPORTInternational application No.
PCT/US2012/033415**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 9
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

The above claim refers to claim 8 which is not drafted in accordance with the second and/or third sentences of Rule 6.4(a).
Thus, no meaningful search could be carried out.
3. ☒ Claims Nos.: 8
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.