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Joong [KR/KR]; 510-1502, Expo Apt., Jeonmin-dong, Yuseong-gu, Daejeon 305-762 (KR). KIM, Gyung Rok [KR/KR]; 303-1502, Expo Apt., Jeonmin-dong, Yuseong-gu, Daejeon 305-761 (KR). NOH, Myoung Han [KR/KR]; 102-501, Expo Apt., Jeonmin-dong, Yuseong-gu, Daejeon 305-761 (KR). KOH, Jae Suk [KR/KR]; 11-404, Science Ville, 257-26, Wonchon-dong, Yuseong-gu, Daejeon 305-370 (KR). CHOI, Hyun Chul [KR/KR]; 203-702, Expo Apt., Jeonmin-dong, Yuseong-gu, Daejeon 305-761 (KR). KIM, Eun Kyoung [KR/KR]; 107-501, Saemmeori Apt., Dunsan 2-dong, Seo-gu, Daejeon 302-777 (KR). LEE, Yoon Kyung [KR/KR]; 1678, Uncheon-dong, Heungdeok-gu, Cheongju-si, Chungcheongbuk-do 361-110 (KR). LEE, Jong Hyung [KR/KR]; 117-1503, Jeonwon maeul World 3-cha Apt., Janggi-dong, Gimpo-si, Gyeonggi-do 415-746 (KR). CHOI, Sun [KR/KR]; 109-101, Honorsville, Yongsan-dong, Yuseong-gu, Daejeon 305-500 (KR). OH, Seung Hoon [KR/KR]; 3-1408, Seongyeong Apt., Daechi-dong, Gangnam-gu, Seoul 135-836 (KR). KOH, Jae Hyun [KR/KR]; 103-608, Chowon Apt., Mannyon-dong, Seo-gu, Daejeon 302-740 (KR). LEE, Sang Il [KR/KR]; 209-702, Daewoo Apt., Daedeok Technovalley 2-danji, Gwanpyeong-dong, Yuseong-gu, Daejeon 305-509 (KR). LEE, Seung Woo [KR/KR]; 603-209, Gukhwa Apt., Dunsan 3-dong, Seo-gu, Daejeon 302-782 (KR).

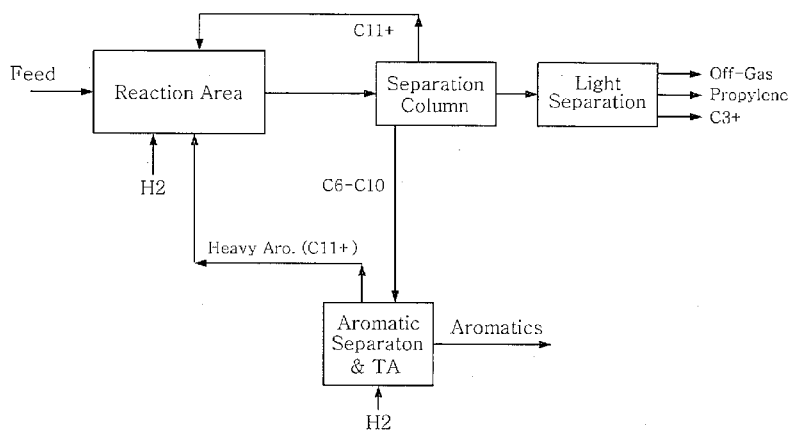
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(54) **Title:** METHOD OF PRODUCING VALUABLE AROMATICS AND OLEFINS FROM HYDROCARBONACEOUS OILS DERIVED FROM COAL OR WOOD

fig. 1



(57) **Abstract:** This invention relates to a method of producing aromatics and olefins from oils derived from coal or wood, including partially saturating and cracking the oils derived from coal or wood in a hydrogenation & reaction area, separating them depending on the number of carbons, recirculating heavy oils having 11 or more carbons to the hydrogenation & reaction area, feeding oils suitable for producing BTX to an aromatic separation process and a transalkylation process to recover aromatics, and feeding hydrocarbonaceous components having 5 or less carbons to a light separation process, thus obtaining olefins.

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A. CLASSIFICATION OF SUBJECT MATTER*C07C 4/06(2006.01)i, C07C 7/04(2006.01)i, C07C 15/00(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 4/06; C10G 35/095; C10G 35/04; C07C 1/00

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: coal, wood, hydrogenation, cracking, separation, aromatics, xylene, BTX, transalkylation, olefin, recovery, zeolite.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2009-0227823 A1 (HUBER, GEORGE W. et al.) 10 September 2009 See abstract; Figures 1-17; claims 1, 14-15.	1-14
A	CARLSON, TORREN R. et al., "Aromatic Production from Catalytic Fast Pyrolysis of Biomass-Derived Feedstocks", Topics in Catalysis 2009, Vol. 52, 241-252. See abstract; Figures 2-13.	1-14
A	MARTIN, N. et al., "Copyrolysis of wood biomass and synthetic polymers mixtures. Part II: characterisation of the liquid phases", Journal of Analytical and Applied Pyrolysis 2002, Vol. 65, 41-55. See abstract; Figure 1.	1-14
A	US 2003-0019792 A1 (CHEN, CONG-YAN et al.) 30 January 2003 See abstract; Figures 1A-1C & 2.	1-14

 Further documents are listed in the continuation of Box C. See patent family annex.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009-0227823 A1	10.09.2009	AU 2009-220133 A1	11.09.2009
		CA 2753985 A1	11.09.2009
		CN 102015969 A	13.04.2011
		EP 2257612 A2	08.12.2010
		EP 2257612 A4	31.08.2011
		IL 207961 D0	30.12.2010
		JP 2011-514927 A	12.05.2011
		WO 2009-111026 A2	11.09.2009
		WO 2009-111026 A3	28.01.2010
US 2003-0019792 A1	30.01.2003	US 6900365 B2	31.05.2005