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C07C 2/74 (2006.01) C07C 407/00 (2006.01)  
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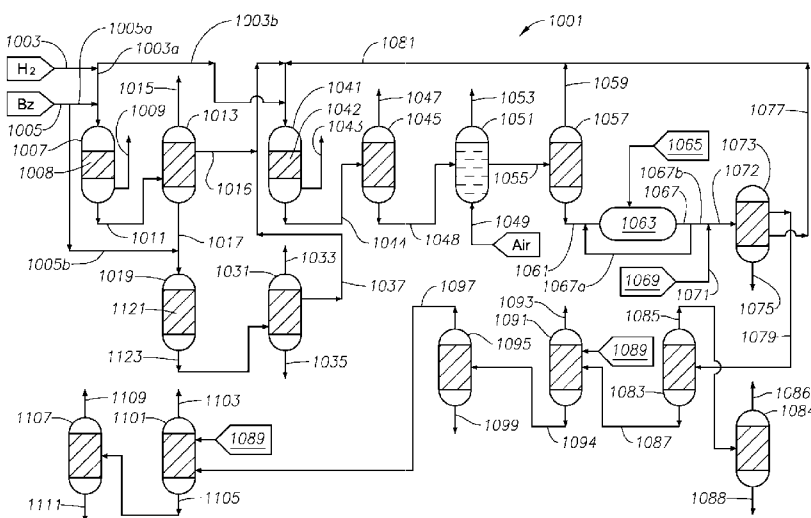
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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

[Continued on next page]

(54) Title: PROCESS FOR MAKING PHENOL AND/OR CYCLOHEXANONE



**Published:**

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29 October 2015

- *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))*

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/US2014/065789

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. C07C37/08 C07C39/04 C07C2/74 C07C13/28 C07C45/53  
 C07C49/403 C07C407/00 C07C409/14  
 ADD.  
 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  
 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
 EPO-Internal, CHEM ABS Data, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2012/082229 A1 (EXXONMOBIL CHEM PATENTS INC [US]; DAKKA JIHAD M [US]; MOZELESKI EDMUND) 21 June 2012 (2012-06-21) the whole document paragraph [0056] - paragraph [0057]; claims 20, 22	1-7
X	WO 2012/082232 A1 (EXXONMOBIL CHEMICAL PATENST INC [US]; WANG KUN [US]; DAKKA JIHAD M [US]) 21 June 2012 (2012-06-21) the whole document paragraph [0044]; claim 1; example 5	1-4

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	"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
"E" earlier application or patent but published on or after the international filing date	"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
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"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
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search <b>5 February 2015</b>	Date of mailing of the international search report <b>17/09/2015</b>
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer <b>Mooren, Nicolai</b>
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# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2014/065789

## 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.:  
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:
  
3.  Claims Nos.:  
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:

see additional sheet

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 fees, this Authority did not invite payment of additional fees.
  
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.:

2-7(completely); 1(partially)

### 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.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2014/065789

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2012082229	A1	21-06-2012	NONE
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WO 2012082232	A1	21-06-2012	US 2014187821 A1 03-07-2014
		WO 2012082232 A1	21-06-2012
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**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 2-7(completely); 1(partially)

Processes wherein the concentrations of MCPB or its specific isomers or ratios of such concentrations in the first and the second mixture are specified

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2. claims: 8(completely); 1(partially)

Processes wherein the concentration of MCPB2trans in the cleavage product mixture is specified

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3. claims: 9(completely); 1(partially)

Processes wherein it is specified that the first mixture is obtained by separating the product mixture of a hydroalkylation of benzene

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4. claims: 10, 11(completely); 1(partially)

Processes wherein a fourth mixture comprising at least 80 wt.% of cyclohexylbenzene and a fifth mixture comprising cyclohexylbenzene hydroperoxide at a concentration higher than the third mixture are obtained and the fifth mixture is fed to the cleavage reactor as a portion of the third mixture

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5. claims: 12-29(completely); 1(partially)

Processes wherein the cleavage product mixture is separated to obtain a cyclohexylbenzene fraction, a phenol fraction and a cyclohexanone fraction

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