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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:
14 January 2010

(54) Title: PROCESS FOR THE PRODUCTION OF ALKYLENE CARBONATE

(57) Abstract: The invention relates to a process for the production of an alkylene carbonate by the reaction of an alkylene oxide with carbon dioxide in the presence of a phosphonium catalyst in which process (a) the alkylene oxide, carbon dioxide and phosphonium catalyst are continuously introduced into a reaction zone from which a product stream containing alkylene carbonate and phosphonium catalyst is withdrawn; (b) alkylene carbonate and a stream containing phosphoniura catalyst are separated from the product stream; (c) the alkylene carbonate, separated in step (b), is recovered as product; and (d) the stream containing phosphoniura catalyst, separated in step (b), is recycled to the reaction zone, in which process a treatment of alkylene carbonate and/or catalyst with a sorption agent comprising carbon is carried out.



WO 2009/141361 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2009/056098

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07D317/36 C07D317/38

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)
C07D

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 practical, search terms used)

EPO-Internal, WPI Data, BEILSTEIN Data, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X,Y	WO 2007/104730 A (SHELL INT RESEARCH [NL]; VAN DER HEIDE EVERT [NL]; VAN KESSEL GERARDUS) 20 September 2007 (2007-09-20) cited in the application Abstract; claims; page 3, lines 26-31. -----	1-4,8-13
Y	WO 01/66510 A (HUNTSMAN SPEC CHEM CORP [US]) 13 September 2001 (2001-09-13) Abstract; claims. -----	1-4,8-13
Y	WO 2004/063183 A (ARCO CHEM TECH [US]) 29 July 2004 (2004-07-29) Abstract; claims. -----	1-4,8-13

☐ 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 document but published on or after the international filing date
- *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)
- *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

1 July 2009

Date of mailing of the international search report

17/11/2009

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INTERNATIONAL SEARCH REPORT

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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.:

see additional sheet

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-4, 8-13 (all part)

directed to a process for the production of an alkylene carbonate, in which process a treatment of only the alkylene carbonate is carried out with a sorption agent comprising carbon.

2. claims: 1-4 (part), 5-7 (complete), 8-13 (part)

directed to a process for the production of an alkylene carbonate, in which process a treatment of the catalyst is carried out with a sorption agent comprising carbon.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2009/056098

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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