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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A CATALYST, A PROCESS FOR PREPARING THE CATALYST, AND A PROCESS FOR THE PRODUCTION OF AN OLEFIN OXIDE, A 1,2-DIOL, A 1,2-DIOL ETHER, OR AN ALKANOLAMINE

(57) Abstract: A catalyst which comprises a carrier and silver deposited on the carrier, which carrier has a surface area of at least 1.3 m²/g, a median pore diameter of more than 0.8 μm, and a pore size distribution wherein at least 80 % of the total pore volume is contained in pores with diameters in the range of from 0.1 to 10 μm and at least 80 % of the pore volume contained in the pores with diameters in the range of from 0.1 to 10 μm is contained in pores with diameters in the range of from 0.3 to 10 μm; process for the preparation of a catalyst which process comprises depositing silver on a carrier, wherein the carrier has been obtained by a method which comprises forming a mixture comprising: a) from 50 to 95 weight percent of a first particulate a-alumina having a median particle size (d₅₀) of from 5 to 100 μm; b) from 5 to 50 weight percent of a second particulate a-alumina having a d₅₀ which is less than the d₅₀ of the first particulate a-alumina and which is in the range of from 1 to 10 μm; and c) an alkaline earth metal silicate bond material; weight percent being based on the total weight of a-alumina in the mixture; and firing the mixture to form the carrier; a process for the epoxidation of an olefin, which process comprises reacting a feed comprising an olefin and oxygen in the presence of a said catalyst; and a process for preparing a 1,2-diol, a 1,2-diol ether or an alkanolamine.



WO 2006/133183 A3

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/021903

A. CLASSIFICATION OF SUBJECT MATTER

INV. B01J23/66 B01J35/10 C07D301/10

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)

B01J C07D 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 practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003/162655 A1 (SZYMANSKI THOMAS [US] ET AL) 28 August 2003 (2003-08-28)	1-24, 29-34
Y	claims 1-5,7 page 1, paragraphs 1,3,5,6,10-12 page 2, paragraphs 13-17,22 page 3, paragraphs 28,31-39,44; table 1	35
X	EP 0 327 356 A1 (CHINA PETROCHEMICAL CORP [CN]; BEIJING RES INST YANSHAN PETRO [CN]) 9 August 1989 (1989-08-09) claims 1,13-18,22,23 examples comparative,3 page 3, lines 46-65	19,20, 29-32,34
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 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.

Z document member of the same patent family

Date of the actual completion of the international search

13 April 2007

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/021903

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 761 394 A (LAURITZEN ANN M [US]) 2 August 1988 (1988-08-02) figure 7 tables 1(carrier,F) column 3, lines 3-11 column 4, lines 13-25 column 5, lines 5-29 column 6, lines 37-43 column 14, line 39 - column 15, line 20	1,8, 12-16, 24,29-32
Y	US 2003/162984 A1 (LOCKEMEYER JOHN ROBERT [US] ET AL) 28 August 2003 (2003-08-28) cited in the application claim 38	35
X	EP 0 393 785 A1 (UNION CARBIDE CHEM PLASTIC [US]) 24 October 1990 (1990-10-24) page 7, lines 43-55 page 10, line 42 - page 11, line 52 table I page 18, line 30 - page 19, line 22 page 20, lines 1-45 page 21, line 52 - page 23, line 41 page 35, lines 2-24	19-22, 29-32
A	US 3 664 970 A (MAIO DENNIS A DE) 23 May 1972 (1972-05-23) claim 1 table 1 column 3, lines 42-62	1-35
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A	WO 96/04989 A (SCIENT DESIGN CO [US]) 22 February 1996 (1996-02-22) example 1 page 6, lines 18-31	1-35
X	US 5 733 842 A (GERDES WILLIAM H [US] ET AL) 31 March 1998 (1998-03-31)	25,27-32
Y	claims 7-9 examples column 4, lines 11-37 column 5, lines 10-21 column 6, lines 14-16	26,33-35

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97/40933 A (SHELL INT RESEARCH [NL]) 6 November 1997 (1997-11-06)	25, 27-32
Y	claims 1-5, 10, 11 page 6, line 24 - page 7, line 17 page 7, lines 31-34 page 9, lines 28-30 page 10, lines 3-15 table 1 page 21, line 16 - page 23, line 13 page 31, lines 6-11	26, 33-35
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/021903

Box 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 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 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.
- 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: 1-24,29-35

catalysts comprising silver deposited on a carrier having a surface area of at least 1.0 m²/g, a median pore diameter of more than 0.8 microns and a specific pore size distribution, the preparation thereof and a process for the epoxidation of an olefin in the presence thereof

2. claims: 25-35

preparation of silver-containing catalyst wherein the carrier is prepared by a mixture of two different particulate alpha-alumina and an alkaline earth metal silicate bond material, and a process for the epoxidation of an olefin in the presence of a catalyst obtained by such a preparation

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/021903

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International application No

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