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(54) Title: PROCESS FOR THE PRODUCTION OF COMPOUNDS VIA HAZARDOUS INTERMEDIATES IN A SERIES OF MICROREACTORS

(57) Abstract: Multi-step process for the preparation of compounds via hazardous intermediates comprising the steps of a) preparing in a microreactor a hazardous intermediate and b) optionally performing one or more reaction steps on the hazardous intermediate in one or more additional microreactors and c) further converting the hazardous intermediate with a suitable reaction agent in a subsequent microreactor until a stable end product is formed.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2007/004562

A. CLASSIFICATION OF SUBJECT MATTER

INV. C07C247/04 C07C211/03 C07C209/42 C07C29/151 C07C31/125

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 practical, search terms used)

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 113 205 A (DEGUSSA A.-G., FED. REP. GER.) 3 August 1983 (1983-08-03) page 2, lines 18-60; examples 6,8,10,12,14-29	1-4, 7-10,14, 15,19
X	US 4 351 954 A (MURAMATSU, HIROSHIGE ET AL) 28 September 1982 (1982-09-28) column 1, line 50 - column 2, line 18; examples 1-3	1-4, 7-10,14, 15,19
X	KAWASAKI, MASANORI ET AL: "Total Synthesis of (-)-Kaitocephalin" ORGANIC LETTERS, 7(19), 4165-4167 CODEN: ORLEF7; ISSN: 1523-7060, 2005, XP002419675 page 4166, right-hand column	1-4, 7-10,14, 15,19
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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 14 April 2008	Date of mailing of the international search report 13/05/2008
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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, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer van Laren, Martijn
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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2007/004562

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>BONINI, CARLO ET AL: "Synthesis, biological activity and modelling studies of two novel anti HIV PR inhibitors with a thiophene containing hydroxyethylamino core" TETRAHEDRON , 61(27), 6580-6589 CODEN: TETRAB; ISSN: 0040-4020, 2005, XP004923063 page 6582; compounds 5,10,12</p>	1-4, 7-10,14, 15,19
X	<p>SCHWARZ, JACOB B. ET AL: "Novel cyclopropyl .beta.-amino acid analogues of pregabalin and Gabapentin that target the .alpha.2-.delta. protein" JOURNAL OF MEDICINAL CHEMISTRY , 48(8), 3026-3035 CODEN: JMCMAR; ISSN: 0022-2623, 2005, XP002419676 page 3028; compounds 49-52</p>	1-4, 7-10,14, 15,19
X	<p>KRAWCZYK, EWA ET AL: "Regio- and stereoselective reactions between cyclic Baylis-Hillman type adducts and N-nucleophiles and P-nucleophile" TETRAHEDRON , 61(6), 1449-1457 CODEN: TETRAB; ISSN: 0040-4020, 2005, XP004723077 page 1450, left-hand column; compounds 9,10,14,15</p>	1-4, 7-10,14, 15,19
X	<p>PANDEY, SATYENDRA KUMAR ET AL: "Enantioselective synthesis of (-)-galantinic acid" TETRAHEDRON LETTERS , 45(30), 5877-5879 CODEN: TELEAY; ISSN: 0040-4039, 2004, XP004517786 page 5878; compounds 1,9-15</p>	1-4, 7-10,14, 15,19
X	<p>DHAVALA, DILIP D. ET AL: "Asymmetric Dihydroxylation of D-Glucose Derived .alpha.,.beta.-Unsaturated Ester: Synthesis of Azepane and Nojirimycin Analogues" JOURNAL OF ORGANIC CHEMISTRY , 69(14), 4760-4766 CODEN: JOCEAH; ISSN: 0022-3263, 2004, XP002419679 page 4762; compounds 6,7</p>	1-4, 7-10,14, 15,19
X	<p>HALE, KARL J. ET AL: "A practical new asymmetric synthesis of (2S,3S)- and (2R,3R)-3- hydroxyleucine" TETRAHEDRON , 50(30), 9181-7 CODEN: TETRAB; ISSN: 0040-4020, 1994, XP002419680 page 9181; compounds 1,6</p>	1-4, 7-10,14, 15,19

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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2007/004562

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KASINA, SUDHAKAR ET AL: "Tissue distribution properties of technetium-99m-diamide-dimercaptide complexes and potential use as renal radiopharmaceuticals" JOURNAL OF MEDICINAL CHEMISTRY, 29(10), 1933-40 CODEN: JMCMAR; ISSN: 0022-2623, 1986, XP000566375 page 1934, right-hand column - page 1935, left-hand column; compounds 13,14 -----	1-4, 7-10,14, 15,19
X	DE 40 00 163 A1 (CHEMIE LINZ G.M.B.H., GERMANY) 11 July 1991 (1991-07-11) abstract; claims; examples -----	1,2,5-8, 11-19
X	EP 0 863 146 A2 (DOW CORNING CORP., USA) 9 September 1998 (1998-09-09) abstract; claims; examples -----	1,2,5-8, 11-19
X	US 2003/233010 A1 (LEE, JUNNING ET AL) 18 December 2003 (2003-12-18) claims; examples -----	1,2,5-8, 11-19
X	RIMMER, STEPHEN ET AL: "Synthesis of telechelic oligostyrenes by the ozonolysis of poly(styrene-stat-butadiene): protection of styrene units against ozone attack by the use of Di-N-alkyl amides as sacrificial ozone scavengers" JOURNAL OF POLYMER SCIENCE, PART A: POLYMER CHEMISTRY, 34(17), 3573-3583 CODEN: JPACEC; ISSN: 0887-624X, 1996, XP002476397 page 3575, left-hand column - page 3581, right-hand column -----	1,2,5-8, 11-19
X	E. ZADOK ET AL.: "Ozonolysis by microwave discharge of oxygen of naphthalene adsorbed on florosil" TETRAHEDRON LETTERS, vol. 25, no. 37, 1984, pages 4175-4176, XP002476398 the whole document -----	1,2,5-8, 11-19
X	WO 02/072518 A (DSM FINE CHEM AUSTRIA GMBH [AT]; KLOIMSTEIN ENGELBERT [AT]; SAJTOS ALE) 19 September 2002 (2002-09-19) abstract; claims; examples -----	1,2,5-8, 11-19
X	EP 0 147 593 A (CHEMIE LINZ AG [AT]; LENTIA GMBH [DE]) 10 July 1985 (1985-07-10) abstract; claims; examples -----	1,2,5-8, 11-19
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INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2007/004562

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 709 450 A (DU PONT) 26 May 1954 (1954-05-26) claims; examples -----	1, 2, 5-8, 11-19

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2007/004562

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.:

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 (in part), 2 (in part), 3, 4, 7-10 (in part), 14 (in part), 15 (in part), 19 (in part)

A multistep process comprising the steps a) reacting an organic compound with a source of azide anion to form the corresponding organic azide b) optionally performing more reactions on the organic azide and c) reducing the organic azide to form an amine.

2. claims: 1 (in part), 2 (in part), 5, 6, 7, 8 (in part), 11-13, 14 (in part), 15 (in part), 16-18, 19 (in part)

A multistep process comprising the steps a) reacting an organic compound with hydrogenperoxide, ozone or oxygen to form the corresponding organic peroxide or hydroperoxide b) optionally performing more reactions on the organic peroxide or hydroperoxide and c) reducing the organic peroxide or hydroperoxide to form a stable alcohol, aldehyde or ketone, optionally protected as the hydrate, hemiacetal or acetal.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2007/004562

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