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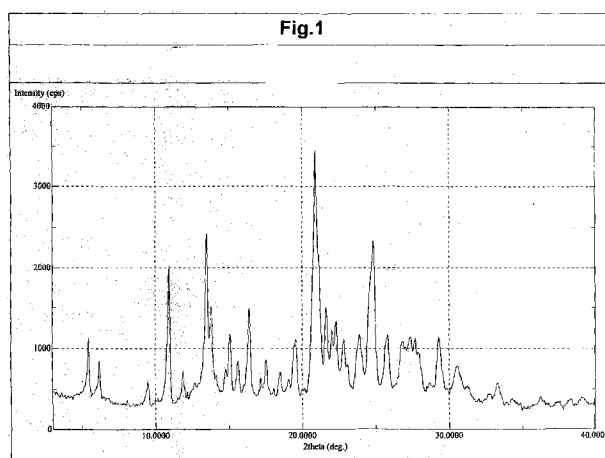
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(88) Date of publication of the international search report:

21 April 2011

(54) Title: POLYMORPHIC FORMS OF MANIDIPINE



(57) Abstract: The invention relates to various new polymorphic forms of manidipine and pharmaceutically acceptable salts thereof. The invention also relates to processes for the preparation of the polymorphic forms of manidipine and pharmaceutically acceptable salts thereof.

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2010/001615

A. CLASSIFICATION OF SUBJECT MATTER

INV. C07D211/90 A61K31/442 A61K31/444 A61P9/12
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)

C07D A61K

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, PAJ, BIOSIS, EMBASE, 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	MEGURO K ET AL: "NEW 1,4-DIHYDROPYRIDINE DERIVATIVES WITH POTENT AND LONG-LASTING HYPOTENSIVE EFFECT", CHEMICAL AND PHARMACEUTICAL BULLETIN, vol. 33, no. 9, 1 September 1985 (1985-09-01), pages 3787-3797, XP000602167, ISSN: 0009-2363 cited in the application experimental - page 3795 ----- -/-	1-3,6-9, 12-15, 18-21, 24, 30-32, 35-47



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

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2010/001615

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.

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2010/001615

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HOSAKA, SHOUICHI ET AL: "Effect of compression on interaction between 1,4-dihydropyridine compounds and lactose monohydrate", CHEMICAL & PHARMACEUTICAL BULLETIN, vol. 53, no. 5, 2005, pages 503-507, XP002621863, experimental materials -----	1-3,6-9, 12-15, 18-21, 24,41-44
X	FR 2 924 223 A1 (CHIESI FARMACEUTICI S.P.A., ITALY) 29 May 2009 (2009-05-29) cited in the application page 2, lines 14-15 -----	1-3,6-9, 12-15, 18-21, 24,41-44
X	KAJINO M. ET AL: "Synthesis and biological activities of optical isomers of manidipine", CHEMICAL & PHARMACEUTICAL BULLETIN, vol. 37, no. 8, 19 May 2007 (2007-05-19), pages 2225-2228, XP0008133087, cited in the application compound 1 -----	1-3,6-9, 12-15, 18-21, 24, 30-32, 35-47
X	EP 0 094 159 A1 (TAKEDA CHEMICAL INDUSTRIES LTD [JP]) 16 November 1983 (1983-11-16) cited in the application example 61 -----	1-3,6-9, 12-15, 18-21, 24, 30-32, 35,41-44
Y	WO 88/07525 A1 (BYK GULDEN LOMBERG CHEM FAB [DE]) 6 October 1988 (1988-10-06) example 10 -----	1-47
Y	RAGNO, GAETANO ET AL: "Multivariate least squares regression applied to the spectrophotometric analysis of manidipine and its main photoproduct", FARMACO, vol. 58, no. 9, 2003, pages 909-915, XP002621864, experimental 2.3 -----	1-47

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2010/001615

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
FR 2924223	A1	29-05-2009	ES 2328438 A1	12-11-2009
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			JP 2502823 T	06-09-1990
			JP 2625190 B2	02-07-1997
			US 4994461 A	19-02-1991

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-6, 41

crystalline form I of manidipine dihydrochloride

2. claims: 7-12, 42

crystalline form II of manidipine dihydrochloride

3. claims: 13-18, 43

crystalline form III of manidipine dihydrochloride

4. claims: 19-24, 44

crystalline form IV of manidipine dihydrochloride

5. claims: 25-29, 45

amorphous form V of manidipine dihydrochloride

6. claims: 30-35, 46

crystalline form VI of manidipine base

7. claims: 36-40, 47

amorphous form VII of manidipine base
