

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
29 September 2005 (29.09.2005)

PCT

(10) International Publication Number
WO 2005/090310 A3

(51) International Patent Classification⁷: **C07D 221/20**,
C07C 231/14

(21) International Application Number:
PCT/EP2005/051243

(22) International Filing Date: 17 March 2005 (17.03.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
MI2004A000501 17 March 2004 (17.03.2004) IT

(71) Applicant (for all designated States except US): **CAF-FARO S.r.l.** [IT/IT]; Via Borgonuovo 14, I-20121 Milano (IT).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **DANIELI, Bruno** [IT/IT]; Via S. Martino 11/C, I-20122 Milano (IT). **DEL-OGU, Pietro** [IT/IT]; Via Roma 17, I-34132 Trieste (IT). **DE ROSA, Sabrina** [IT/IT]; Via Mesol 18, I-33052 Cervignano del Friuli (IT). **FUGAZZA, Lorenza** [IT/IT]; Via Rossini 2, I-26848 San Fiorano (IT).

(74) Agents: **GERLI, Paolo** et al.; Notarbartolo & Gervasi S.p.A., Corso di Porta Vittoria 9, I-20122 Milano (IT).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv)) for US only

Published:

— with international search report

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

16 March 2006

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: PROCESS FOR PREPARING CYCLOHEXANEDIACETIC ACID MONOAMIDE

(57) Abstract: A new process is described for synthesising cyclohexanediacetic acid monoamide, a key compound in the synthesis of grabapentin precursors. The process of the invention is characterised by reacting cyclohexanone with cynoacetamide and immediately after, with a suitable malonic acid ester. A new intermediate (5-cyano-2,4-dioxo-3-azaspiro[5,5]undecane-1-carboxylic acid ester) is obtained which is convertible, under mild reaction conditions, into cyclohexanediacetic acid monoamide.



WO 2005/090310 A3

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2005/051243

A. CLASSIFICATION OF SUBJECT MATTER

C07D221/20 C07C231/14

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 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, 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.
A	THOLE F B ET AL: "THE FORMATION AND REACTION OF IMINO-COMPOUNDS. PART XV. THE PRODUCT OF IMINO-DERIVATIVES OF PIPERADINE LEADING TO THE FORMATION OF THE BETABETA-DISUBSTITUTED GLUTARIC ACIDS" JOURNAL OF THE CHEMICAL SOCIETY, TRANSACTIONS, CHEMICAL SOCIETY, LETCHWORTH, GB, no. 99, 1911, pages 422-448, XP001118611 ISSN: 0368-1645 page 444 page 424 ----- -/--	1-11



Further documents are listed in the continuation of box C.



Patent family members are listed in 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

3 November 2005

Date of mailing of the international search report

24/11/2005

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

Steendijk, M

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP2005/051243

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ATKINSON ET AL.: "Mechanism of the boron..." J.CHEM.SOC.PERKIN TRANS 1, no. 23, 1976, pages 2457-2462, XP009039957 page 2460, right-hand column page 2459	1-11
A	US 6 613 904 B2 (MONTANARI STEFANIA MARIA PAOLA) 2 September 2003 (2003-09-02) cited in the application example 1	1-11
A	ATKINSON ET AL.: "Synthesis of trispiro..." HELV.CHIM.ACTA, vol. 50, no. 1, 1967, pages 23-43, XP009039956 page 29 page 25	1-11
A	KON ET AL.: "Chemistry of the three..." J.CHEM.SOC.,ABSTRACTS, 1926, pages 2727-2735, XP009039913 page 2728 - page 2729	1-11
P,X	DATABASE ZREGISTRY 'Online! 15 November 2004 (2004-11-15), XP002352408 retrieved from STN Database accession no. RN 780785-83-3 abstract	1

Information on patent family members

PCT/EP2005/051243

Form PCT/ISA/210 (patent family annex) (January 2004)