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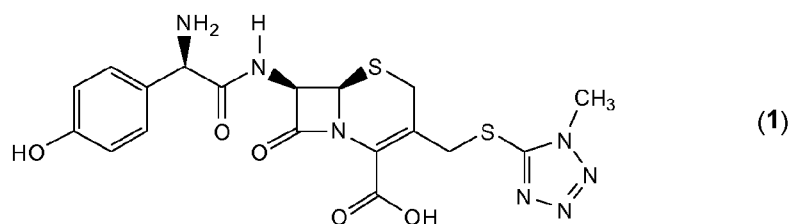
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(88) Date of publication of the international search report:

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(54) Title: CRYSTALLINE CEFOPERAZONE INTERMEDIATE, PROCESS FOR ITS PREPARATION AND PHARMACEUTICAL USE THEREOF



(57) Abstract: The present invention relates to a crystalline form of an intermediate for cefoperazone of formula (1) and to a process for the preparation thereof by enzymatic condensation of a 3'-thiosubstituted β -lactam nucleus with a phenylglycine derivative.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2012/061912

A. CLASSIFICATION OF SUBJECT MATTER

INV. C12P35/04 C07D501/24 A61K31/545
ADD. A61P31/04

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)

C12P 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 practicable, search terms used)

EPO-Internal, WPI 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	US 3 946 003 A (COOPER ROBIN D G) 23 March 1976 (1976-03-23) column 3, line 41 - line 65; claims 1,2; examples 1,2; table II ----- -/--	1,13



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 application or patent 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

30 October 2012

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21/01/2013

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Rufet, Jacques

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2012/061912

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DUNN G L ET AL: "Orally active 7-phenylglycyl cephalosporins. Structure-activity studies related to cefatrizine (SK & F 60771)", JOURNAL OF ANTIBIOTICS, JAPAN ANTIBIOTICS RESEARCH ASSOCIATION, TOKYO, JP, vol. 29, no. 1, 1 January 1976 (1976-01-01), pages 65-80, XP008157551, ISSN: 0021-8820 abstract; tables 1-6, compound 4a; page 67, especially last sentence to page 69; page 72, footnote; page 74, line 35 to page 75, last sentence; page 77, Procedure A; page 78, Procedure C -----	1,13
X	EP 0 523 585 A2 (BIOCHEMIE GMBH) 20 January 1993 (1993-01-20) page 7, line 30 - line 47; example 3 -----	1
X	EP 1 394 262 A1 (BIOFERMA MURCIA S.A.) 3 March 2004 (2004-03-03) paragraph [0043], line 37; page 5 - page 6; claims 1,18; example 16 page 7, paragraphs 39, 41 page 8, line 22 - line 23 page 8, line 37 - line 38 page 17; example 16 page 18; example 17 page 19 - page 20; claims 1, 9-11, 18 -----	1
A	CAIRA M R: "CRYSTALLINE POLYMORPHISM OF ORGANIC COMPOUNDS", TOPICS IN CURRENT CHEMISTRY, SPRINGER, BERLIN, DE, vol. 198, 1 January 1998 (1998-01-01), pages 163-208, XP001156954, ISSN: 0340-1022, DOI: 10.1007/3-540-69178-2_5 ISBN: 978-3-540-36760-4 abstract -----	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP2012/061912

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.:

1-3, 13

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: 1-3, 13

crystalline form of an intermediate compound for
cefoperazone of general formula (1) and its use as
antibacterial agent

2. claims: 4-12

alternative process for the preparation of a compound of
general formula (1)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2012/061912

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 3946003	A	23-03-1976	NONE

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			WO 2004020652 A2 11-03-2004
