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(54) Title: FERMENTATION PROCESS FOR THE PREPARATION OF L-THREONINE

(57) Abstract: The invention relates to a process for the fermentative preparation of L-threonine in which an L-threonine-producing microorganism of the Enterobacteriaceae family is cultured by the feed process, and a portion of the fermentation broth is then separated off in order to be utilized for inoculation of further media.



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INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 01/08603

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N1/21 C12P13/08 C12N15/70 //(C12N1/21,C12R1:19)

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)

IPC 7 C12N C12P

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, 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	EP 0 593 792 A (AJINOMOTO KK) 27 April 1994 (1994-04-27) cited in the application example 2	1-3,6-12
A	GB 1 009 370 A (AJINOMOTO I I) 10 November 1965 (1965-11-10) the whole document	1-3,6-12
P,X	EP 1 085 091 A (DEGUSSA ;KERNFORSCHUNGSANLAGE JUELICH (DE)) 21 March 2001 (2001-03-21) abstract paragraph [0035]	1-3
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☒ 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.

"&" document member of the same patent family

Date of the actual completion of the international search

1 August 2002

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 01/08603

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 02 26993 A (LIAW HUNGMINJAMES ;MAO WEIYING (US); YANG YUEQIN (US); BRADSHAW) 4 April 2002 (2002-04-04) abstract; claims 1-59 page 39, last paragraph -page 40, paragraph 1 -----	1-3,6,8, 10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 01/08603

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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.:

1-3, 6-12

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: 1-3,6-12

Process for the fermentative preparation of L-threonine wherein an Enterobacteriaceae microorganism is cultured by fed-batch, a portion of the broth is separated off, the remaining broth is topped up with fresh medium and cultured again. The drawing off and topping up can be repeated several times.

2. Claims: 4,5

L-Threonine-producing and-secreting microorganisms of the Enterobacteriaceae family which have an enhanced resistant aspartate kinase I-homoserine dehydrogenase I, an attenuated threonine deaminase, a resistance to at least 5 g/l threonine and the ability to utilize sucrose as a source of carbon, and the parB gene region.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 01/08603

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