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(54) Title: ENZYME CATALYZED ORGANOSILICON ESTERS AND AMIDES

(57) Abstract: Methods for forming organosilicon esters and amides are provided. Additionally, organosilicon esters and amides are provided. The organosilicon esters and amides may be formed by contacting a hydrolase enzyme with an organosilicon reactant and an organic reactant. The enzyme may catalyze the formation of an ester bond between carboxylic acid, ester, or amide functional groups of the organosilicon or organic reactant and alcohol functional groups of the organic or organosilicon reactant. The enzyme may catalyze the formation of an amide bond between carboxylic acid, ester, or amide functional groups of the organosilicon or organic reactant and amine functional groups of the organic or organosilicon reactant.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25561

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C12P 9/00, 13/02; C12N 9/16, 9/20; B01F 17/00
 US CL : 435/ 129, 131, 196, 198; 528/26, 26.5, 28, 29, 38

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)
 U.S. : 435/ 129, 131, 196, 198; 528/26, 26.5, 28, 29, 38

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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|--|
| X | US6,288,129 A (GRUNING et al) 11 September 2001, see entire disclosure in particular the examples of esterification and column 3 for the products per se plus column 9, line 55 and column 10 line s 56-57 for process conditions and enzymes. | 1-8, 12-19, 21-28, 33-40, 42-44, 47-48 |
| --- | | ----- |
| Y | | 9-11, 20, 29-32, 41, 45-46, 49-54 |

Further documents are listed in the continuation of Box C. See patent family annex.

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| <p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> | <p>"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</p> <p>"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</p> <p>"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</p> <p>"&" document member of the same patent family</p> |
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| <p>Date of the actual completion of the international search</p> <p>15 February 2005 (15.02.2005)</p> | <p>Date of mailing of the international search report</p> <p style="text-align: center; font-size: 1.2em;">08 MAR 2005</p> |
| <p>Name and mailing address of the ISA/US</p> <p>Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230</p> | <p>Authorized officer <i>Herbert J Lilling</i></p> <p>HERBERT J LILLING</p> <p>Telephone No. 703-308-0196</p> |

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25561

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claim 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. Claim 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:

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.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.