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(54) Title: SUPERABSORBENT POLYMER PARTICLES COMPRISING FUNCTIONALIZERS AND METHOD OF MAKING THEM

(57) Abstract: The present invention relates to superabsorbent polymer particles having functionalizers covalently bound to the surface of precursor superabsorbent polymer particles. The functionalizers of the present invention comprise a grafting unit with a radiation acti-vatable group and a functional unit covalently bound to the grafting unit. The grafting unit is bound to an aliphatic C-H group comprised at the surface of the precursor superabsorbent polymer particle. The functional unit comprises chemical structures which are not present in the precursor superabsorbent polymer particle. These functional units add an additional function to the precursor superabsorbent polymer particle or modifying an ex-isting function of the precursor superabsorbent polymer particle. Moreover, the invention relates to a process for making these superabsorbent polymer particles.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER INV. C08F265/04 C08L51/00 A61L15/00		
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) C08F C08L C09D C09J A61L		
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		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99/55393 A (SCA HYGIENE PROD AB ; STRANDQVIST KERSTI (SE)) 4 November 1999 (1999-11-04) page 5, lines 24,27-31 page 6, line 4 claim 2 page 6, lines 28-31	1-10,16
X	US 6 043 311 A (HOUBEN JOCHEN ET AL) 28 March 2000 (2000-03-28) abstract column 2, lines 50-67 column 4, lines 8-11 column 3, lines 49-62 claims 1,2,6; examples 1-5	1-10,16
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☒ 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 "G" document member of the same patent family		
Date of the actual completion of the international search 9 November 2005		Date of mailing of the international search report 16 -03- 2006
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 Hammond, A

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 196 19 680 A (BUNA SOW LEUNA OLEFINVERB GMBH) 20 November 1997 (1997-11-20) * page 2, line 9 ; page 3, line 41-42 * page 2, line 45 - page 3, line 60 -----	1-4,6-9
X	DE 102 21 202 A (BASF AG) 10 July 2003 (2003-07-10) page 2, line 1 - page 11, line 40; claims 1-9 -----	1-4,6-9
X	WO 96/15180 A (PALUMBO GIANFRANCO ; PROCTER & GAMBLE (US)) 23 May 1996 (1996-05-23) * page 5, line 4-5, 8 "polyacrylic acid" ; page 5, line 14-19 *claims 1-12 -----	1-4,6-9
A	US 6 403 674 B1 (SCHUBERT MARK A) 11 June 2002 (2002-06-11) * claims 2,3,1,7,9,13,1-42 ; column 1, line 1-9 * -----	1-10,16
A	US 5 635 569 A (SACKMANN GUENTER ET AL) 3 June 1997 (1997-06-03) column 2, line 24 - column 4, line 2 -----	1-10,16
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A	DE 102 57 449 A (BASF AG) 6 November 2003 (2003-11-06) abstract; claims 1-10 -----	1-10,16

INTERNATIONAL SEARCH REPORT

International application No.
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Box 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 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 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 - 10, 16

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: 1-10,16

A superabsorbent polymer particle comprising - a precursor superabsorbent polymer particle consisting of cross-linked poly(meth)acrylic acid and salts thereof as described in application claim 1 ; functionalisers covalently bound to the surface of said precursor superabsorbent polymer particle, wherein said functionalisers comprise a functional unit and a grafting unit as described in application claim 1.

2. claims: 11-15,17

An independent general method of making superabsorbent polymer particles having functionalisers which are not dependent on any previous claims, the said method comprises the steps (a), (b) and (c) as described in application claim 11.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2005/027851

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Information on patent family members

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