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Declarations under Rule 4.17:

— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) **Date of publication of the international search report**:
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(54) **Title**: ACIDIC GAS PERMEATED CARBOXYALKYL STARCH PARTICLES, EXTRUDATES, AND PROCESS FOR MAKING THE SAME

(57) **Abstract**: The present disclosure relates to particles comprising carboxyalkyl starch that are permeated with an acidic gas and their uses as absorbent materials. It was discovered that superabsorbent materials could be obtained from carboxyalkyl starch particles permeated with the acidic gas and heated to a temperature of at least 100°C until they reach an AUL at 0.7 psi. of at least 14 g/g and a CRC of at least 18 g/g. Moreover, it was discovered that the pH of alkaline starch extrudates can be adjusted by permeating particles of the extrudate with the acidic gas even with treating the particles to temperatures less than 100°C. The carboxyalkyl starch particles obtained by the methods described herein are characterized as having intramolecular ester bonds, which are greater in number at the surface of the particle than in the core, and the particles have a greater concentration of cation of the acidic gas at the surface than a the core.

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INTERNATIONAL SEARCH REPORT

International application No.
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A. CLASSIFICATION OF SUBJECT MATTER

A61L 15/60(2006.01)i, A61L 15/28(2006.01)i

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)

A61L 15/60; B01J 20/22; C08B 15/00; B01J 13/00; C08B 31/12; A61L 15/28

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean utility models and applications for utility models
Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) & Keywords: carboxyalkyl starch, acidic gas, alkaline starch

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	WO 2008-037082 A1 (ARCHER-DANIELS-MIDLAND COMPANY et al.) 03 April 2008 See abstract and claims 1, 6, 8-9, 12, 15-19, 21, 24-29, 35-40.	1-9,11-16 10,17-27
X A	WO 2005-123781 A2 (STOCKHAUSEN GMBH et al.) 29 December 2005 See abstract and claims 1-32.	1-9,11-16 10,17-27
X A	US 4959341 A1 (WALLACH; DONALD F. H.) 25 September 1990 See abstract and claims 1-14.	1-9,11-16 10,17-27
A	WO 00-35504 A1 (SCA HYGIENE PRODUCTS ZEIST B.V. et al.) 22 June 2000 See the whole document.	1-27

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

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"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	Date of mailing of the international search report
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Information on patent family members

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