(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
10 December 2009 (10.12.2009)

PCT

(10) International Publication Number
WO 2009/149334 A3

(51) International Patent Classification:
B03D 1/01 (2006.01) ***C09B 67/00*** (2006.01)
C04B 24/12 (2006.01) ***C23F 11/10*** (2006.01)
C04B 24/36 (2006.01) ***B01F 3/00*** (2006.01)
C05C 3/00 (2006.01)

(21) International Application Number:
PCT/US2009/046386

(22) International Filing Date:
5 June 2009 (05.06.2009)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/059,146 5 June 2008 (05.06.2008) US

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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:
15 April 2010

WO 2009/149334 A3

(54) Title: MAILLARD REACTIONS PRODUCTS FOR ENHANCING SELECTIVE SEPARATIONS

(57) Abstract: Use of a Maillard reaction product as an adjuvant in a variety of applications including solid-liquid separations, corrosion inhibition, emulsification, dust suppression, slow release fertilization, viscosity modification and others and especially as a depressant or collector in separation processes, including the selective separation of solids and/or ionic species from aqueous media, such as in the process of froth flotation.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/046386

A. CLASSIFICATION OF SUBJECT MATTER
INV. B03D1/01 C04B24/12 C04B24/36 C05C3/00 C09B67/00
C23F11/10 B01F3/00

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)
B03D C04B C05C C09B C23F B01F

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 11 009190 A (JAPAN TOBACCO INC) 19 January 1999 (1999-01-19) abstract paragraph [0013] - paragraph [0019]	1
X	EP 1 652 861 A (JH BIOTECH INC [US]) 3 May 2006 (2006-05-03) paragraphs [0002], [0007], [0015], [0020], [0026], [0027], [0047] - [0049], [0071] - [0074]	1
X	US 2007/123680 A1 (SWIFT BRIAN L [US] ET AL) 31 May 2007 (2007-05-31) paragraph [0035]; claims 1,24,25; examples 7,13; tables	1

☐ 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.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 September 2009	25/02/2010

Name and mailing address of the ISA/	Authorized officer
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/046386

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.:

see additional sheet

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. claim: 1

A process for obtaining a material comprising adding a maillard product

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2. claim: 2

A process for separating a material comprising adding a maillard product

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3. claim: 3

A process for emulsifying a material comprising using a maillard product

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4. claim: 4

A process for reducing corrosion using a maillard product

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5. claim: 5

A process for suppressing dust using a maillard product

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6. claim: 6

A process of slow fertilisation using a maillard product

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7. claim: 7

A process for reducing viscosity in a cementious slurry using a maillard product

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8. claim: 8

A Maillard product formed by a "fatty" amine

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9. claim: 9

A maillard product having a high cationic functionality

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10. claim: 10

A maillard product having a sulfur functionality

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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11. claim: 11

A maillard product having a phosphorus functionality

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12. claim: 12

A maillard product having a sulfate or sulfonate functionality

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13. claim: 13

A maillard product having a hydroxamic functionality

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14. claim: 14

A maillard product having a silane functionality

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15. claim: 15

A maillard product having a phenolic functionality

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16. claim: 16

A maillard product having an aza crown chelating functionality

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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2009/046386

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 11009190 A	19-01-1999	JP 3689533 B2	31-08-2005
EP 1652861 A	03-05-2006	NONE	
US 2007123680 A1	31-05-2007	US 2007027283 A1	01-02-2007
		US 2007123679 A1	31-05-2007
		US 2007142596 A1	21-06-2007