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(71) Applicant: CORNING INCORPORATED [US/US]; 1

Riverfront Plaza, Corning, New York 14831 (US).

(72) Inventors: DENG, Huayun; 127 Fieldview Drive, Paint-

ed Post, New York 14870 (US). FANG, Ye; 3433 Conhoc-

ton Road, Painted Post, New York 14870 (US). FU, Qiang;

7 Tara Place, Painted Post, New York 14870 (US). LI,

Aize; 57 Katie Lane, Painted Post, New York 14870 (US).

MA, Lina; 10451 North Rd., Corning, New York 14830

(US). MAURO, John Christopher; 10712A Skyline Drive,

Corning, New York 14830 (US).

(74) Agent: HAACK, John L; Corning Incorporated, Intellec-

tual Property Department, SP-Ti-03-01, Corning, New York

14831 (US).

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(54) Title: BIOACTIVE BOROPHOSPHATE GLASSES

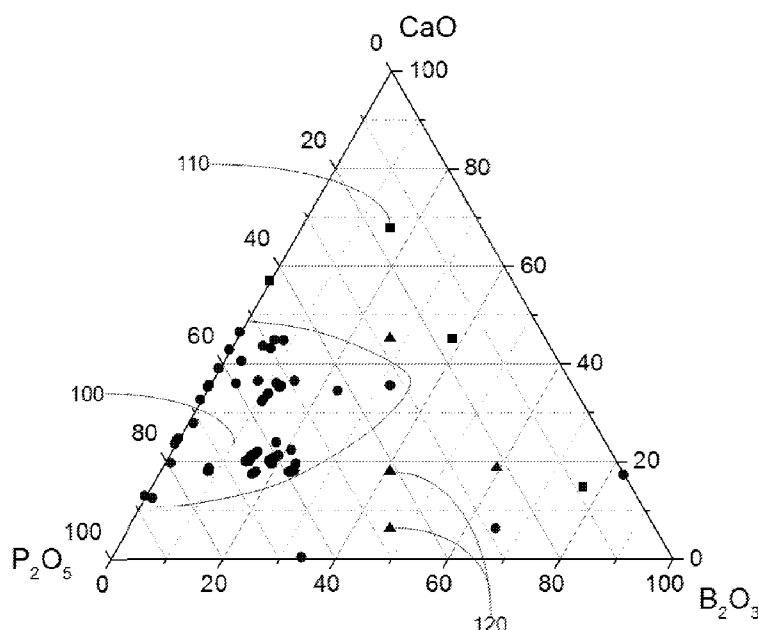


Fig. 1

(57) Abstract: A borophosphate glass composition including B₂O₃, P₂O₅ and CaO, and optionally a source additive selected from: Li₂O, Na₂O, K₂O, Al₂O₃, ZnO, MgO, Fe₂O₃/FeO, CuO/Cu₂O, and mixtures thereof, as defined herein. Also disclosed are bioactive compositions or substrates including the disclosed borophosphate glass composition, and at least one live cell. Also disclosed are methods of inhibiting or increasing the relative amount of species containing boron, phosphorous, or both, being released into an aqueous solution from aborophosphate glass composition defined herein. Also disclosed is a method of proliferating cells on a bioactive substrate as defined herein. Also disclosed are related glass compositions that exclude one of B₂O₃, P₂O₅, and CaO.



HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER					
INV.	C03C3/062	A61L27/54	C03C3/064	C03C3/145	C03C3/16
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	C12N5/071				
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) C03C 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 practicable, search terms used) EPO-Internal, WPI Data
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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	EP 1 116 698 A1 (ISHIZUKA GLASS [JP]) 18 July 2001 (2001-07-18) example H; table 1	1-5, 10-12 6-9, 13-21
X A	----- EP 1 580 172 A2 (SCHOTT AG [DE]) 28 September 2005 (2005-09-28) example 2; table 1	1-5, 10-12 6-9, 13-21
X A	----- US 5 081 394 A (MORISHITA HAJIME [JP] ET AL) 14 January 1992 (1992-01-14) example 7; table 3	1-5, 10-12 6-9, 13-21
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<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.	<input checked="" type="checkbox"/> See patent family annex.
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* Special categories of cited documents :	
<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 but 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>

Date of the actual completion of the international search 21 December 2017	Date of mailing of the international search report 09/01/2018
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Lecerf, Nicolas
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INTERNATIONAL SEARCH REPORT

International application No
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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	<p>DATABASE WPI Week 200505 Thomson Scientific, London, GB; AN 2005-043923 XP002774643, & JP 2004 359754 A (ISHIZUKA GLASS KK) 24 December 2004 (2004-12-24)</p>	1-5, 10-12
A	<p>abstract; example B; table 2</p>	6-9, 13-21
A	<p>----- WO 2006/072394 A1 (SCHOTT AG [DE]; RAEKE GUIDO [DE]; ROEMER HILDEGARD [DE]; SCHRECKENBERG) 13 July 2006 (2006-07-13) table 2</p>	20,21
A	<p>----- WO 2007/141978 A1 (KOA GLASS CO LTD [JP]; PINOLE CO LTD [JP]; KITAMURA MAMORU [JP]; TOKIN) 13 December 2007 (2007-12-13) table 1</p>	20,21
A	<p>----- EP 1 452 496 A1 (ISHIZUKA GLASS [JP]) 1 September 2004 (2004-09-01) tables 1,2</p>	20,21
A	<p>----- US 2 532 386 A (ARMISTEAD WILLIAM H) 5 December 1950 (1950-12-05) table 1</p>	20,21
A	<p>----- WO 2014/159240 A1 (NOVABONE PRODUCTS LLC [US]) 2 October 2014 (2014-10-02) paragraphs [0009] - [0035]; example 2</p>	1-21

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2017/034417

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.:

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. claims: 1-19

The problem solved by the first invention is to provide:

- a borophosphate glass composition comprising (in mol%):
0,1-80% B2O3 ,
30-80% P2O5 ,
5 to 50% CaO
- a bioactive composition comprising the borophosphate glass composition of claim 1
- an article comprising the borophosphate glass composition of claim 1
- a method of inhibiting the release of at least one of B2O3 and P2O5 species into an aqueous solution
- a method of increasing the release of at least one of B2O3 and P2O5 species into an aqueous solution
- a method of proliferating cells.

2. claims: 20, 21

The problem to be solved by the second invention is to provide:

- a glass composition comprising at least one composition selected from the group of claim 20

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/US2017/034417

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			EP 2969985 A1 20-01-2016
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