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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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, 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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(54) Title: METHODS OF ISOLATING 4-CHLORO-2-FLUORO-3-SUBSTITUTED-PHENYLBORONIC ACIDS

(57) Abstract: Provided herein are methods of isolating a 4-chloro-2-fluoro-3-substituted-phenylboronic acid. The method comprises contacting a mixture of water, a water miscible organic solvent, and a 4-chloro-2-fluoro-3-substituted-phenylboronic acid with a salt to form a water miscible organic solvent layer and a water layer. The 4-chloro-2-fluoro-3-substituted-phenylboronic acid is partitioned into the water miscible organic solvent layer, which is separated from the water layer. Additional methods are disclosed, as is a 4-chloro-2-fluoro-3-substituted-phenylboronic acid produced by one of the methods, wherein the 4-chloro-2-fluoro-3-substituted-phenylboronic acid is obtained at a yield of greater than approximately 90%.



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/048371**A. CLASSIFICATION OF SUBJECT MATTER****C07F 5/02(2006.01)i, C07C 43/205(2006.01)1, C07B 63/00(2006.01)1**

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)

C07F 5/02; C07F 1/02; GOIN 30/88; C07C 65/00; G01N 33/02; G01N 30/06; C07F 7/22

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: chloro fluoro, phenylboronic acid, acetonitril, water, solvent, isolating, layer.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 2008-0045734 A1 (BALKO, T. W. et al.) 21 February 2008 See [0223].	1, 17 2-16
X A	US 7611647 B2 (ARNDT KIM E. et al.) 03 November 2009 See example 3.	17 1-16
A	KR 10-0491163 B1 (THE REPUBLIC OF KOREA, NATIONAL AGRICULTURAL PRODUCTS QUALITY MANAGEMENT SERVICE) 24 May 2005 See claim 1.	1-17
A	JP 2009-053165 A (TSUMURA & CO) 12 March 2009 See [0004].	1-17



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

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"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

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Date of the actual completion of the international search

01 FEBRUARY 2013 (01.02.2013)

Date of mailing of the international search report

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Name and mailing address of the ISA/KR

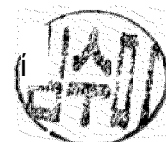
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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JP 2009-053165 A	12.03.2009	None	