



## (51) International Patent Classification:

*C01G 53/04* (2006.01)      *C01G 51/04* (2006.01)  
*C01D 15/00* (2006.01)      *H01M 4/1391* (2010.01)  
*C01G 45/02* (2006.01)      *H01M 10/0525* (2010.01)

## (21) International Application Number:

PCT/IB2017/000587

## (22) International Filing Date:

17 May 2017 (17.05.2017)

## (25) Filing Language:

English

## (26) Publication Language:

English

## (30) Priority Data:

62/339,488      20 May 2016 (20.05.2016)      US

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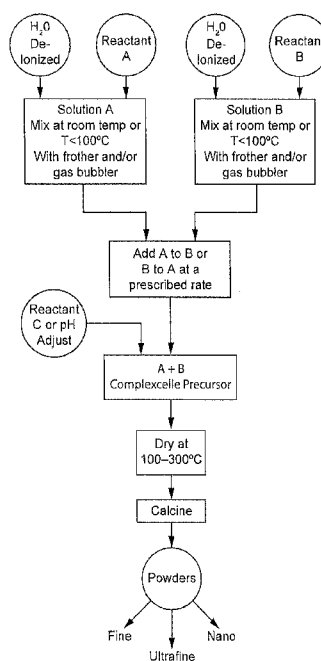
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(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KH, KN, KP, KR,

(54) Title: FINE AND ULTRAFINE POWDERS AND NANOPOWDERS OF LITHIUM METAL OXIDES FOR BATTERY APPLICATIONS

Fig. 3



(57) Abstract: A method of forming an improved calcined lithium metal oxide is provided wherein the metal comprises at least one of nickel, manganese and cobalt. The method comprises forming a first solution in a first reactor wherein the first solution comprises at least one first salt of at least one of lithium, nickel, manganese or cobalt in a first solvent. A second solution is formed wherein the second solution comprises a second salt of at least one of lithium, nickel, manganese or cobalt in a second solvent wherein the second salt is not present in the first solution. A gas is introduced into said first solution to form a gas saturated first solution. A second solution is added to the gas saturated first solution without bubbling to form a lithium metal salt. The lithium metal salt dried and calcined to form the calcined lithium metal oxide.



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.

- (84) Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, 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, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

**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))*

**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:**

04 January 2018 (04.01.2018)

## INTERNATIONAL SEARCH REPORT

International application No.

**PCT/IB2017/000587**

## A. CLASSIFICATION OF SUBJECT MATTER

IPC: **C01G 53/04** (2006.01), **C01D 15/00** (2006.01), **C01G 45/02** (2006.01), **C01G 51/04** (2006.01),  
**H01M 4/1391** (2010.01), **H01M 10/0525** (2010.01)

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)

IPC (2006.01): C01G 53/04, C01G 45/02, C01G 51/04, C01D 15/00; IPC (2010.01): H01M 4/1391, H01M 10/0525

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

IPC (2006.01): H01M 4/48, H01M 4/50, H01M 4/52

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

Databases: QUESTEL, Canadian Patent Database, CIPO Library Discovery Tool

Keywords: lithium, metal, nickel, manganese, cobalt, oxide, solution, solvent, salt, gas, air, carbon dioxide, argon, nitrogen, ammonia, saturat\*, dissolve\*, dry\*, calcin, diffuser, aerator, nozzle, nucleat\*, complex\*, precursor\*, froth\*, bubble\*

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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

☒ See patent family annex.

|                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| *<br>"A"<br>"E"<br>"L"<br>"O"<br>"P" | Special categories of cited documents:<br>document defining the general state of the art which is not considered to be of particular relevance<br>earlier application or patent but published on or after the international filing date<br>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)<br>document referring to an oral disclosure, use, exhibition or other means<br>document published prior to the international filing date but later than the priority date claimed | "T"<br>"X"<br>"Y"<br>"&" | 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<br>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<br>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<br>document member of the same patent family |
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Date of the actual completion of the international search  
01 November 2017 (01-11-2017)

Date of mailing of the international search report  
27 November 2017 (27-11-2017)

Name and mailing address of the ISA/CA  
Canadian Intellectual Property Office  
Place du Portage I, C114 - 1st Floor, Box PCT  
50 Victoria Street  
Gatineau, Quebec K1A 0C9  
Facsimile No.: 819-953-2476

Authorized officer

Philip Gbor (819) 639-8475

## INTERNATIONAL SEARCH REPORT

International application No.

**PCT/IB2017/000587**

| C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT |                                                                                    |                       |
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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

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