

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
09 December 2021 (09.12.2021)



(10) International Publication Number
WO 2021/246965 A1

(51) International Patent Classification:

H01M 50/431 (2021.01) *C01G 31/00* (2006.01)
C01B 32/15 (2017.01) *C01G 23/00* (2006.01)
C01B 32/914 (2017.01) *H01M 10/52* (2010.01)
C01G 33/00 (2006.01) *H01M 10/58* (2010.01)

(21) International Application Number:

PCT/SG2021/050317

(22) International Filing Date:

02 June 2021 (02.06.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

10202005210P 02 June 2020 (02.06.2020) SG

(71) Applicant: **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way, #20-10 Connexis North, Singapore 138632 (SG).

(72) Inventors: **YING, Jackie, Y.**; c/o NanoBio Lab, 31 Biopolis Way, The Nanos, Singapore 138669 (SG). **CHEONG, Jian Liang**; c/o NanoBio Lab, 31 Biopolis Way, The Nanos, Singapore 138669 (SG).

(74) Agent: **SPRUSON & FERGUSON (ASIA) PTE LTD**; P.O. Box 1531, Robinson Road Post Office, Singapore 903031 (SG).

(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, IT, JO, 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, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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).

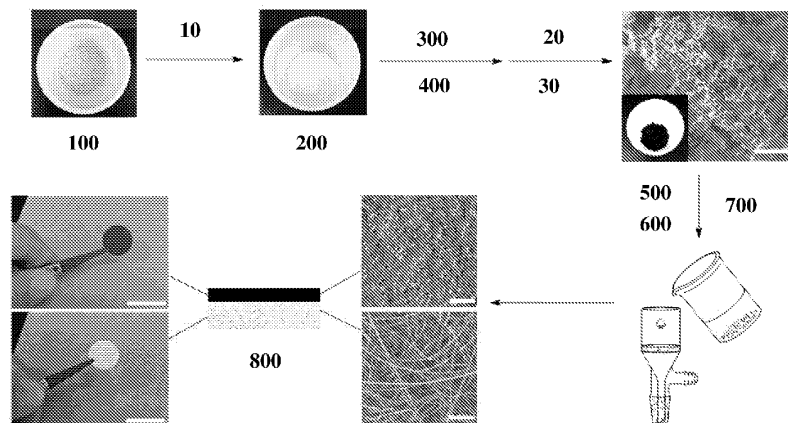
Declarations under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

— with international search report (Art. 21(3))
— in black and white; the international application as filed contained color or greyscale and is available for download from PATENTSCOPE

(54) Title: A CORAL-LIKE COMPOSITE MATERIAL AND A METHOD OF PREPARING THE SAME



[Fig. 1]

(57) Abstract: There is provided a coral-like composite material comprising highly dispersed conductive metal nitride, metal carbide or metal carbonitride nanoparticles on mesoporous carbon nanosheets, and a method of preparing the same. There is also provided a coating material for a modified separator of a lithium-sulfur battery comprising the coral-like composite material as described herein, a conducting carbon material and a binder, and a method of preparing the same.

WO 2021/246965 A1