

Title (en)  
METHOD FOR MANUFACTURING DENSE LAYERS THAT CAN BE USED AS ELECTRODES AND/OR ELECTROLYTES FOR LITHIUM ION BATTERIES, AND LITHIUM ION MICROBATTERIES OBTAINED IN THIS WAY

Title (de)  
VERFAHREN ZUR HERSTELLUNG DICHTER SCHICHTEN ALS ELEKTRODEN UND/ODER ELEKTROLYTE FÜR LITHIUM-IONEN-BATTERIEN UND AUF DIESE WEISE ERHALTENE LITHIUM-IONEN-MIKROBATTERIEN

Title (fr)  
PROCEDE DE FABRICATION DE COUCHES DENSES, UTILISABLES COMME ELECTRODES ET/OU ELECTROLYTES POUR BATTERIES A IONS DE LITHIUM, ET MICROBATTERIES A IONS DE LITHIUM AINSI OBTENUES

Publication  
**EP 4128389 A1 20230208 (FR)**

Application  
**EP 21714977 A 20210330**

Priority  
• FR 2003104 A 20200330  
• IB 2021052604 W 20210330

Abstract (en)  
[origin: CA3173248A1] Disclosed is a method for manufacturing a dense layer, comprising the following steps: providing a substrate and a suspension of non-agglomerated nanoparticles of a material P; depositing a layer on the substrate from the suspension; drying the layer obtained in this way; densifying the dried layer by mechanical compression and/or heat treatment; the method being characterised in that the suspension of non-agglomerated nanoparticles of material P comprises nanoparticles of material P having a size distribution, the size being characterised by its D50 value, such that: - the distribution comprises nanoparticles of material P of a first size D1 of between 20 nm and 50 nm, and nanoparticles of material P of a second size D2 characterised by a D50 value at least five times less than that of D1; or - the distribution has an average size of nanoparticles of material P of less than 50 nm, and a standard deviation to average size ratio greater than 0.6.

IPC 8 full level  
**B01J 35/00** (2006.01); **B01J 37/02** (2006.01); **B82Y 30/00** (2006.01); **B82Y 40/00** (2006.01); **C04B 35/00** (2006.01); **C23C 18/12** (2006.01); **C25D 13/02** (2006.01); **C25D 13/22** (2006.01); **C25D 15/00** (2006.01); **H01M 4/04** (2006.01); **H01M 4/139** (2006.01); **H01M 10/0525** (2006.01); **H01M 10/0562** (2006.01); **H01M 10/0585** (2006.01); **B22F 1/102** (2022.01); **B22F 1/16** (2022.01)

CPC (source: EP IL KR US)  
**B82Y 40/00** (2013.01 - IL); **C01B 25/301** (2013.01 - US); **C01G 23/005** (2013.01 - US); **C01G 45/1242** (2013.01 - US); **C04B 35/01** (2013.01 - EP IL); **C04B 35/016** (2013.01 - EP IL); **C04B 35/16** (2013.01 - EP IL); **C04B 35/447** (2013.01 - EP IL); **C04B 35/457** (2013.01 - EP IL); **C04B 35/462** (2013.01 - EP IL); **C04B 35/486** (2013.01 - EP IL); **C04B 35/495** (2013.01 - EP IL); **C04B 35/547** (2013.01 - EP IL); **C04B 35/584** (2013.01 - EP IL); **C04B 35/597** (2013.01 - EP IL); **C04B 35/62218** (2013.01 - EP IL); **C04B 35/62222** (2013.01 - EP IL); **C25D 13/02** (2013.01 - EP IL US); **C25D 13/22** (2013.01 - EP IL); **H01M 4/0402** (2013.01 - EP IL KR); **H01M 4/0457** (2013.01 - EP IL KR US); **H01M 4/139** (2013.01 - EP IL KR); **H01M 4/485** (2013.01 - US); **H01M 4/505** (2013.01 - US); **H01M 4/628** (2013.01 - US); **H01M 10/0525** (2013.01 - EP IL KR US); **H01M 10/0562** (2013.01 - EP IL KR); **H01M 10/0585** (2013.01 - EP IL KR); **H01M 50/403** (2021.01 - KR); **H01M 50/491** (2021.01 - KR); **B22F 1/102** (2022.01 - EP IL US); **B22F 1/16** (2022.01 - EP IL US); **B82Y 40/00** (2013.01 - EP); **C01P 2004/64** (2013.01 - US); **C01P 2004/84** (2013.01 - US); **C01P 2006/40** (2013.01 - US); **C04B 2235/3203** (2013.01 - EP IL); **C04B 2235/3206** (2013.01 - EP IL); **C04B 2235/3208** (2013.01 - EP IL); **C04B 2235/3213** (2013.01 - EP IL); **C04B 2235/3215** (2013.01 - EP IL); **C04B 2235/3224** (2013.01 - EP IL); **C04B 2235/3225** (2013.01 - EP IL); **C04B 2235/3227** (2013.01 - EP IL); **C04B 2235/3229** (2013.01 - EP IL); **C04B 2235/3232** (2013.01 - EP IL); **C04B 2235/3239** (2013.01 - EP IL); **C04B 2235/3241** (2013.01 - EP IL); **C04B 2235/3258** (2013.01 - EP IL); **C04B 2235/3262** (2013.01 - EP IL); **C04B 2235/3272** (2013.01 - EP IL); **C04B 2235/3275** (2013.01 - EP IL); **C04B 2235/3277** (2013.01 - EP IL); **C04B 2235/3279** (2013.01 - EP IL); **C04B 2235/3281** (2013.01 - EP IL); **C04B 2235/3284** (2013.01 - EP IL); **C04B 2235/3286** (2013.01 - EP IL); **C04B 2235/3289** (2013.01 - EP IL); **C04B 2235/3293** (2013.01 - EP IL); **C04B 2235/5454** (2013.01 - EP IL); **C04B 2235/5472** (2013.01 - EP IL); **C04B 2235/764** (2013.01 - EP IL); **H01M 2004/021** (2013.01 - US); **Y02E 60/10** (2013.01 - EP IL); **Y02P 70/50** (2015.11 - EP IL)

Citation (search report)  
See references of WO 2021198890A1

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

Designated extension state (EPC)  
BA ME

Designated validation state (EPC)  
KH MA MD TN

DOCDB simple family (publication)  
**FR 3108791 A1 20211001**; CA 3173248 A1 20211007; CN 115699345 A 20230203; EP 4128389 A1 20230208; IL 296630 A 20221101; JP 2023519703 A 20230512; KR 20220161450 A 20221206; TW 202139503 A 20211016; US 2023148309 A1 20230511; WO 2021198890 A1 20211007

DOCDB simple family (application)  
**FR 2003104 A 20200330**; CA 3173248 A 20210330; CN 202180038678 A 20210330; EP 21714977 A 20210330; IB 2021052604 W 20210330; IL 29663022 A 20220919; JP 2022559538 A 20210330; KR 20227037960 A 20210330; TW 110111654 A 20210330; US 202117907441 A 20210330