Title (en)

LITHIUM-ION CELL WITH A HIGH SPECIFIC ENERGY DENSITY

Title (de)

LITHIUM-IONEN-ZELLE MIT HOHER SPEZIFISCHER ENERGIEDICHTE

Title (fr)

PILE AU LITHIUM-ION À HAUTE DENSITÉ D'ÉNERGIE SPÉCIFIQUE

Publication

EP 4162554 A1 20230412 (DE)

Application

EP 21727908 A 20210531

Priority

- EP 20179112 A 20200609
- EP 2021064556 W 20210531

Abstract (en)

[origin: WO2021249808A1] A lithium ion cell (100) is known comprising an electrode-separator composite (104) with the sequence: anode (120 / separator (118) / cathode (130), wherein the anode (120) and the cathode (130) each comprise a current collector (110, 115) with a first and a second edge (110e, 115e) and the current collectors each have a main region (122, 126) provided with a layer made of the respective electrode material (123, 125), and a free edge strip (121, 117) extending along the first edge (110e, 115e) and not provided with the electrode material. The composite (104) is provided in the form of a winding with two terminal end sides or is part of a stack, which is formed by two or more identical electrode-separator composites and also has two terminal sides, and is surrounded by a housing optionally together with the other identical electrode-separator composite/s of the stack. The anode (120) and the cathode (130) are designed and/or arranged relative to one another within the composite (104) in such a way that the first edge (110e) of the anode current collector passes out of one of the terminal end sides or sides of the stack and the first edge (115e) of the cathode current collector passes out of the other terminal end sides or sides of the stack. The cell (100) has a contact sheet metal part (101a, 102, 155), with which one of the first edges (110e, 115e) is in direct contact and which is connected to same via welding. According to the invention, the negative electrode material comprises at least one material, as an active material, from the group including silicon, aluminium, tin, antimony and a compound or alloy of these materials, to/from which lithium can reversibly intercalated and deintercalated, in a proportion of 20 wt.% to 90 wt.%.

IPC 8 full level

H01M 10/052 (2010.01); **H01M 4/02** (2006.01); **H01M 4/38** (2006.01); **H01M 4/46** (2006.01); **H01M 10/0583** (2010.01); **H01M 10/0587** (2010.01); **H01M 50/107** (2021.01); **H01M 50/538** (2021.01)

CPC (source: EP KR US)

H01M 4/0404 (2013.01 - US); **H01M 4/364** (2013.01 - US); **H01M 4/386** (2013.01 - EP KR US); **H01M 4/387** (2013.01 - EP KR); **H01M 4/463** (2013.01 - EP KR); **H01M 4/485** (2013.01 - US); **H01M 4/505** (2013.01 - KR US); **H01M 4/525** (2013.01 - KR US); **H01M 4/587** (2013.01 - US); **H01M 4/621** (2013.01 - KR); **H01M 4/624** (2013.01 - KR); **H01M 4/75** (2013.01 - US); **H01M 10/052** (2013.01 - EP); **H01M 10/0525** (2013.01 - KR US); **H01M 10/0566** (2013.01 - KR); **H01M 10/0568** (2013.01 - US); **H01M 10/0569** (2013.01 - US); **H01M 10/0583** (2013.01 - EP KR); **H01M 10/0587** (2013.01 - EP KR); **H01M 50/107** (2021.01 - EP KR); **H01M 50/46** (2021.01 - US); **H01M 50/538** (2021.01 - EP KR); H01M 2004/021 (2013.01 - US); H01M 2004/027 (2013.01 - EP KR US); H01M 2004/028 (2013.01 - KR US); H01M 2300/0025 (2013.01 - KR); H01M 2300/0037 (2013.01 - US); Y02E 60/10 (2013.01 - EP); Y02P 70/50 (2015.11 - EP)

Citation (search report)

See references of WO 2021249808A1

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)

WO 2021249808 A1 20211216; CN 115668564 A 20230131; EP 4162554 A1 20230412; JP 2023529881 A 20230712; KR 20230023718 A 20230217; US 2023238569 A1 20230727

DOCDB simple family (application)

EP 2021064556 W 20210531; CN 202180041474 A 20210531; EP 21727908 A 20210531; JP 2022575715 A 20210531; KR 20237000747 A 20210531; US 202118009349 A 20210531