

Title (en)

METHODS TO PRODUCE METALLIZED CARBON NANO PARTICLES

Title (de)

VERFAHREN ZUR HERSTELLUNG METALLISierter KOHLENSTOFF-NANOPARTIKEL

Title (fr)

PROCÉDÉS POUR FABRIQUER DES NANOPARTICULES DE CARBONE MÉTALLISÉES

Publication

**EP 2681154 A4 20150812 (EN)**

Application

**EP 12753033 A 20120228**

Priority

- SE 1100140 A 20110301
- SE 2012050221 W 20120228

Abstract (en)

[origin: WO2012118434A1] Methods to modify dispersed carbon nano particles using electrochemistry are disclosed. First, dispersions of CNT, graphene, graphite or the like in water or organic solvents are prepared. Secondly, said dispersions are brought in contact with a solution of ionic compounds in a liquid, such as dissolved metal salts in water, whereby the dispersion of carbon nano particles is in electrical connection with one electrode, typically the minus pole, and the second solution is in electrical connection with a second electrode, typically the plus pole. The useful voltage for converting metal salts to the respective metal is between 0 and 10 V, and the voltage may be applied continuously or in intervals, such as every millisecond with a pause of one millisecond. Using the method, metal is precipitated onto or close to the carbon nano particles. A useful method is to pump the dispersion of nano particles and to let it enter the second liquid in the form of growing drops, similar to a dropping mercury electrode. Following the electrochemical metal deposition, the metalized carbon nano particles can be separated and used in various products including composites, coatings, capacitors, cables and other products.

IPC 8 full level

**C01B 31/02** (2006.01); **B82Y 30/00** (2011.01); **B82Y 40/00** (2011.01); **C25D 5/08** (2006.01); **C25D 5/18** (2006.01); **C25D 5/54** (2006.01); **C25D 7/00** (2006.01); **C25D 15/02** (2006.01); **C25D 17/00** (2006.01); **C25D 3/38** (2006.01); **C25D 21/18** (2006.01)

CPC (source: EP SE US)

**B82B 3/00** (2013.01 - SE); **B82Y 30/00** (2013.01 - EP); **B82Y 40/00** (2013.01 - EP SE); **C01B 32/168** (2017.08 - EP); **C01B 32/174** (2017.08 - SE); **C25D 5/18** (2013.01 - EP SE US); **C25D 5/54** (2013.01 - EP SE US); **C25D 7/006** (2013.01 - EP US); **C25D 15/02** (2013.01 - SE); **C25D 17/16** (2013.01 - EP); **C25D 3/38** (2013.01 - EP); **C25D 21/18** (2013.01 - EP)

Citation (search report)

- [XA] WO 2008140623 A1 20081120 - TEXAS SOUTHERN UNIVERSITY [US], et al
- [XA] US 2010092809 A1 20100415 - DRZAL LAWRENCE T [US], et al
- [A] EP 2208557 A1 20100721 - NAT INST OF ADVANCED IND SCIEN [JP]
- [A] EP 0130250 A1 19850109 - MANCHEM LTD [GB]
- [XA] LIU X W ET AL: "Fabrication of metal-graphene hybrid materials by electroless deposition", CARBON, ELSEVIER, OXFORD, GB, vol. 49, no. 2, 1 February 2011 (2011-02-01), pages 477 - 483, XP027515341, ISSN: 0008-6223, [retrieved on 20100929], DOI: 10.1016/J.CARBON.2010.09.044
- [A] ROBERT A. W. DRYFE: "Modifying the liquid/liquid interface: pores, particles and deposition", PHYSICAL CHEMISTRY CHEMICAL PHYSICS, vol. 8, no. 16, 1 January 2006 (2006-01-01), pages 1869, XP055199160, ISSN: 1463-9076, DOI: 10.1039/b518018j
- [A] PLATT ET AL: "Structural and electrochemical characterisation of Pt and Pd nanoparticles electrodeposited at the liquid/liquid interface", ELECTROCHIMICA ACTA, ELSEVIER SCIENCE PUBLISHERS, BARKING, GB, vol. 49, no. 22-23, 15 September 2004 (2004-09-15), pages 3937 - 3945, XP005231285, ISSN: 0013-4686, DOI: 10.1016/J.ELECTACTA.2004.02.050
- [A] DEBABRATA RAUTARAY ET AL: "Using the dynamic, expanding liquid?liquid interface in a Hele?Shaw cell in crystal growth and nanoparticle assembly", FARADAY DISCUSSIONS, vol. 129, 1 January 2005 (2005-01-01), pages 205, XP055199246, ISSN: 1359-6640, DOI: 10.1039/b405599n
- See also references of WO 2012118434A1

Cited by

CN110512246A; CN111019509A; CN112645313A; CN111334153A

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

DOCDB simple family (publication)

**WO 2012118434 A1 20120907**; EP 2681154 A1 20140108; EP 2681154 A4 20150812; SE 1100140 A1 20120902

DOCDB simple family (application)

**SE 2012050221 W 20120228**; EP 12753033 A 20120228; SE 1100140 A 20110301