

Title (en)
QUANTUM DOTS, NANOCOMPOSITE MATERIALS WITH QUANTUM DOTS, OPTICAL DEVICES WITH QUANTUM DOTS, AND RELATED FABRICATION METHODS

Title (de)
QUANTEN-DOTS, NANOZUSAMMENSETZUNGSMATERIALIEN MIT QUANTEN-DOTS, OPTISCHE EINRICHTUNGEN MIT QUANTEN-DOTS UND DIESBEZÜGLICHE HERSTELLUNGSVERFAHREN

Title (fr)
POINTS QUANTIQUES, MATERIAUX NANOCOMPOSITES A POINTS QUANTIQUES, DISPOSITIFS OPTIQUES A POINTS QUANTIQUES ET PROCEDES DE FABRICATION ASSOCIES

Publication
EP 1547153 A4 20101201 (EN)

Application
EP 03816720 A 20030801

Priority

- US 0324245 W 20030801
- US 21199102 A 20020802
- US 21200502 A 20020802
- US 21200102 A 20020802
- US 21200402 A 20020802

Abstract (en)
[origin: WO2005017951A2] The invention relates to quantum dots, nanocomposite materials with quantum dots, optical devices with quantum dots, and related fabrication methods. In one embodiment, a quantum dot comprises a core including a semiconductor material Y selected from the group consisting of Si and Ge. The quantum dot also comprises a shell surrounding the core. The quantum dot is substantially defect free such that the quantum dot exhibits photoluminescence with a quantum efficiency that is greater than 10 percent.

IPC 1-7
H01L 29/06; **H01L 21/76**; **G02B 6/00**

IPC 8 full level
G02B 6/122 (2006.01); **G02F 1/35** (2006.01); **G02F 1/355** (2006.01); **H01L 29/12** (2006.01); **H01L 29/16** (2006.01); **G02B 6/12** (2006.01); **G02F 1/017** (2006.01); **G02F 1/365** (2006.01); **G02F 2/00** (2006.01); **H01L 21/20** (2006.01); **H01L 33/00** (2006.01); **H01L 33/20** (2010.01); **H01L 33/34** (2010.01)

CPC (source: EP)
B82Y 10/00 (2013.01); **B82Y 20/00** (2013.01); **G02B 6/122** (2013.01); **G02B 6/1225** (2013.01); **G02F 1/3515** (2013.01); **G02F 1/3556** (2013.01); **H01L 29/127** (2013.01); **H01L 29/16** (2013.01); **H01L 29/1602** (2013.01); **G02B 2006/12097** (2013.01); **G02B 2006/12145** (2013.01); **G02B 2006/12147** (2013.01); **G02B 2006/12159** (2013.01); **G02B 2006/12195** (2013.01); **G02F 1/01791** (2021.01); **G02F 1/217** (2021.01); **G02F 1/3517** (2013.01); **G02F 1/3521** (2013.01); **G02F 1/365** (2013.01); **G02F 2/006** (2021.01); **G02F 2202/32** (2013.01); **G02F 2202/36** (2013.01); **H01L 21/02381** (2013.01); **H01L 21/02439** (2013.01); **H01L 21/02521** (2013.01); **H01L 21/02546** (2013.01); **H01L 21/02576** (2013.01); **H01L 21/02601** (2013.01); **H01L 33/20** (2013.01); **H01L 33/34** (2013.01)

Citation (search report)

- [XY] KANEMITSU Y ET AL: "Photoluminescence mechanism of silicon quantum dots and wells", ADVANCES IN MICROCRYSTALLINE AND NANOCRYSTALLINE SEMICONDUCTORS - 1996 : SYMPOSIUM HELD DECEMBER 2 - 6, 1996, BOSTON, MASSACHUSETTS, USA; [MATERIALS RESEARCH SOCIETY SYMPOSIUM PROCEEDINGS ; 452], MATERIALS RESEARCH SOC, PITTSBURGH, PA, vol. 452, 2 December 1996 (1996-12-02), pages 195 - 200, XP008127387, ISBN: 978-1-55899-356-3
- [X] H. MORISAKI ET AL.: "Above-band-gap photoluminescence from Si fine particles with oxide shell", JOURNAL OF APPLIED PHYSICS, vol. 70, no. 3, 1 August 1991 (1991-08-01), US, pages 1869 - 1870, XP002602842
- [X] BALASUBRAMANIAN S ET AL: "Three-dimensional epitaxy: thermodynamic stability range of coherent germanium nanocrystallites in silicon host", SURFACE INTERFACE AND STRESS EFFECTS IN ELECTRONIC MATERIAL NANOSTRUCTURES : SYMPOSIUM HELD NOVEMBER 27 - DECEMBER 1, 1995, BOSTON, MASSACHUSETTS, USA; [MATERIALS RESEARCH SOCIETY SYMPOSIUM PROCEEDINGS], PITTSBURGH, PA. : MATERIALS RESEARCH SOC, US, vol. 405, 27 November 1996 (1996-11-27), pages 133 - 138, XP008127391, ISBN: 978-1-55899-308-2
- [XY] J.D. HOLMES ET AL.: "Artificial atoms of silicon", MATERIALS RESEARCH SOCIETY SYMPOSIUM PROCEEDINGS, vol. 582, 29 November 1999 (1999-11-29) - 2 December 1999 (1999-12-02), Warrendale, PA, USA, pages H2.5.1 - H.2.5.5, XP008127478, ISBN: 1-55899-490-4
- See references of WO 2005017951A2

Cited by
JP2013095850A

Designated contracting state (EPC)
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LU MC NL PT RO SE SI SK TR

DOCDB simple family (publication)
WO 2005017951 A2 20050224; **WO 2005017951 A3 20050421**; AU 2003304433 A1 20050307; AU 2003304433 A8 20050307; EP 1547153 A2 20050629; EP 1547153 A4 20101201; JP 2006513458 A 20060420

DOCDB simple family (application)
US 0324245 W 20030801; AU 2003304433 A 20030801; EP 03816720 A 20030801; JP 2005507867 A 20030801