

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
12 October 2006 (12.10.2006)

PCT

(10) International Publication Number
WO 2006/107331 A1

(51) International Patent Classification:
H01F 1/00 (2006.01) *G01N 33/58* (2006.01)
G01N 33/543 (2006.01) *C30B 7/00* (2006.01)

(74) Agent: WALAT, Robert; WOLF, GREENFIELD & SACKS, P.C., 600 Atlantic Avenue, Boston, Massachusetts 02210 (US).

(21) International Application Number:
PCT/US2005/034241

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(22) International Filing Date:
23 September 2005 (23.09.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/950,194 24 September 2004 (24.09.2004) US

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*):
AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH [SG/SG]; 20 Biopolis Way, #07-01, Centros 138668 (SG).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): YING, Jackie [US/SG]; 31 Toh Avenue, 508056 (SG). SELVAN, Subramanian [IN/SG]; JURONG WEST STREET, BLK 658D, #12-626, 644658 (SG). YI, Dong [—/SG]; 3 RIDGEWOOD CLOSE, BLK #10-02, Lunalilo Rise, 276694 (SG). LEE, Su [—/SG]; 450 CORPORATION ROAD, #04-01, Tower 1, ParcVista, 649810 (SG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: COATED COMPOSITES OF MAGNETIC MATERIAL AND QUANTUM DOTS

(57) Abstract: Composites and methods associated with the same are provided. The composite structures (10) are formed of quantum dots (12) and magnetic nanoparticles (14). The structures may be coated, for example, with a non-organic shell such as silica. In some cases, the shell may be functionalized or derivatized to include compounds, atoms, or materials that can alter or improve properties such as water solubility, water stability, photo-stability and biocompatibility. A reverse microemulsion process can be used to form the coated composites. The composition and other characteristics of the composites may be controlled to provide desired magnetic and optical properties. The structures may be used in a variety of applications including biological labeling, magnetic resonance imaging (MRI) and drug targeting, amongst others.

WO 2006/107331 A1