CROSS-REFERENCE ART COLLECTIONS

700 NANOSTRUCTURE
701 .Integrated with dissimilar structures on a common substrate
702 .Having biological material component
703 ...Cellular
704 ...Nucleic acids (e.g., DNA or RNA, etc.)
705 ...Protein or peptide
706 ...Carbohydrate
707 ...Having different types of nanoscale structures or devices on a common substrate
708 ...With distinct switching device
709 ...Including molecular switching device
710 .....Biological switching
711 .....Nucleic acid switching
712 ...Formed from plural layers of nanosized material (e.g., stacked structures, etc.)
713 ...Including lipid layer
714 ...Containing protein
715 ...On an organic substrate
716 ...Biological cell surface
717 ...Lipid substrate
718 ...Carbohydrate substrate
719 ...Nucleic acid substrate
720 ...On an electrically conducting, semi-conducting, or semi-insulating substrate
721 ...On a silicon substrate
722 ...On a metal substrate
723 ...On an electrically insulating substrate
724 ...Devices having flexible or movable element
725 ...Nanomotor/nanoactuator
726 ...Using chemical reaction/biological energy (e.g., ATP, etc.)
727 ...Formed from biological material
728 ...Nucleic acids (e.g., DNA or RNA, etc.)
729 ...From protein or unit thereof (e.g., enzyme or carboxyl group, etc.)
730 ...For electrical purposes
731 ...Formed from a single atom, molecule, or cluster
732 ...Nanocantilever
733 ...Nanodiaphragm
734 ...Fullerenes (i.e., graphene-based structures, such as nanohorns, nanococoons, nanoscrolls, etc.) or fullerene-like structures (e.g., WSe2 or MoS2 chalcogenide nanotubes, planar C3N4, etc.)
735 ...Carbon buckyball (C60, C70, etc., and derivatives and modifications thereof)
736 ...Having atoms interior to the carbon cage
737 ...Having a modified surface
738 ....Modified with biological, organic, or hydrocarbon material
739 ...Modified with an enzyme
740 ...Modified with atoms or molecules bonded to the surface
741 ...Modified with dissimilar atoms or molecule substituted for carbon atoms of the buckyball (e.g., impurity doping or compositional substitution, etc.)
742 ...Carbon nanotubes (CNTs)
743 ...Having specified tube end structure (e.g., close-ended shell or open-ended tube, etc.)
744 ...Having atoms interior to the carbon cage
745 ...Having a modified surface
746 ....Modified with biological, organic, or hydrocarbon material
747 ...Modified with an enzyme
748 ...Modified with atoms or molecules bonded to the surface
749 ...Modified with dissimilar atoms or molecules substituted for carbon atoms of the CNT (e.g., impurity doping or compositional substitution, etc.)
750 ...Single-walled
...With specified chirality and/or electrical conductivity (e.g., chirality of (5,4), (5,5), (10,5), etc.)

...Multi-walled

...With polymeric or organic binder

.Dendrimer (i.e., serially branching or "tree-like" structure)

.Nanosheet or quantum barrier/well (i.e., layer structure having one dimension or thickness of 100 nm or less)

.Lipid layer

.Layer containing protein

.Mono-atomic layer on delta-doped sheet

.Quantum well dimensioned for intersubband transitions (e.g., for use in unipolar light emitters or quantum well infrared photodetectors, etc.)

.Superlattice with graded effective bandgap (e.g., "CHIRP-graded" superlattice, etc.)

.Superlattice with well or barrier thickness adapted for increasing the reflection, transmission, or filtering of carriers having energies above the bulk-form conduction or valence band energy level of the well or barrier (i.e., well or barrier with integer^carrier/4 thickness)

.Nanowire or quantum wire (axially elongated structure having two dimensions of 100 nm or less)

.Formed along or from crystallographic terraces or ridges

.With specified packing density

.With specified cross-sectional profile (e.g., belt-shaped, etc.)

.Bent wire (i.e., having nonlinear longitudinal axis)

.Mesh structure

.Helical wire

.Formed with nucleic acid

.Formed with polyamide polymers

.Nanoring

.Formed from circular biomolecule (e.g., DNA, heme, chelators, etc.)

.Nanoparticle (structure having three dimensions of 100 nm or less)

.Exhibiting three-dimensional carrier confinement (e.g., quantum dots, etc.)

.Nanosized powder or flake (e.g., nanosized catalyst, etc.)

.Ceramic powder or flake

.Metallic powder or flake

.Within specified host or matrix material (e.g., nanocomposite films, etc.)

.Possessing nanosized particles, powders, flakes, or clusters other than simple atomic impurity doping

.Possessing fully enclosed nanosized voids or physical holes

.Possessing nanosized surface openings that extend partially into or completely through the host material

.Possessing nanosized physical convexity, ridge, or protrusion extending upward from the host's surface

.Organic host/matrix (e.g., lipid, etc.)

.Electrically conducting, semi-conducting, or semi-insulating host material

.Electrically insulating host material

.Fluidic host/matrix containing nanomaterials

.Viscous fluid host/matrix containing nanomaterials

.Of specified organic or carbon-based composition

.In array format

.With heterogeneous nanostructures

.Molecular array

.Nucleic acid array (e.g., human genome array, etc.)
793 .....Protein array
794 .....Chemical library array
795 ....Composed of biological material
796 ...For electrical or electronic purpose
797 ..Lipid particle
798 ...Having internalized material
799 ....Containing biological material
800 .....Nucleic acid (e.g., DNA or RNA, etc.)
801 .....Drug
802 ..Virus-based particle
803 ...Containing biological material in its interior
804 ....Containing nucleic acid
805 ....Containing drug
806 ...With exterior chemical attachment
807 ....Exterior attachment for detection
808 ....Exterior attachment for targeting (e.g., drug targeting, etc.)
809 ..Organic film on silicon
810 .Of specified metal or metal alloy composition
811 .Of specified metal oxide composition (e.g., conducting or semiconducting compositions such as ITO, ZnOx, etc.)
812 ..Perovskites and superconducting composition (e.g., BaxSr1-xTiO3, etc.)
813 .Of specified inorganic semiconductor composition (e.g., periodic table group IV-VI compositions, etc.)
814 ..Group IV based elements and compounds (e.g., CxSiyGez, porous silicon, etc.)
815 ..Group III-V based compounds (e.g., AlaGabIncNxPyAsz, etc.)
816 ...III-N based compounds (e.g., AlxGayInzN, etc.)
817 ....High-indium-content InGaN pooling or clusters
818 ...III-P based compounds (e.g., AlxGayInz2P, etc.)
819 ...III-As based compounds (e.g., AlxGayInzAs, etc.)
820 ...III-Sb based compounds (e.g., AlxGayInzSb, etc.)
821 ...Mixed group V compounds (e.g., III-NxPy, etc.)
822 ...Boron-containing compounds
823 ...Tl-containing or Bi-containing compounds
824 ..Group II-VI nonoxide compounds (e.g., CdxMnyTe, etc.)
825 ..Heterojunction formed between semiconductor materials that differ in that they belong to different periodic table groups (e.g., Ge (Group IV) - GaAs (Group III-V) or InP (group III-V) - CdTe (Group II-VI), etc.)
826 ..Nonstoichiometric semiconductor compounds (e.g., IIIxVy; x does not equal y, etc.)
827 ..Formed from hybrid organic/inorganic semiconductor compositions
828 ..Biological composition interconnected with inorganic material
829 ..Organic or biological core coated with inorganic shell
830 ..Inorganic core or cluster coated with organic or biological shell
831 ..Of specified ceramic or electrically insulating compositions
832 ..Having specified property (e.g., lattice-constant, thermal expansion coefficient, etc.)
833 ..Thermal property of nanomaterial (e.g., thermally conducting/insulating or exhibiting Peltier or Seebeck effect, etc.)
834 ..Optical properties of nanomaterial (e.g., specified transparency, opacity, or index of refraction, etc.)
835 ..Chemical or nuclear reactivity/stability of composition or compound forming nanomaterial
836 ...Having biological reactive capability
837 ..Piezoelectric property of nanomaterial
838 ..Magnetic property of nanomaterial
839

MATHEMATICAL ALGORITHMS, E.G., COMPUTER SOFTWARE, ETC., SPECIFICALLY ADAPTED FOR MODELING CONFIGURATIONS OR PROPERTIES OF NANOSTRUCTURE

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MANUFACTURE, TREATMENT, OR DETECTION OF NANOSTRUCTURE

Environmental containment or disposal of nanostructure material

For carbon nanotubes or fullerenes

Gas phase catalytic growth (i.e., chemical vapor deposition)

Growth by vaporization or dissociation of carbon source using a high-energy heat source (e.g., electric arc, laser, plasma, e-beam, etc.)

Purification or separation of fullerenes or nanotubes

Internal modifications (e.g., filling, endohedral modifications, etc.)

Surface modifications (e.g., functionalization, coating, etc.)

Tube end modifications (e.g., capping, joining, splicing, etc.)

With scanning probe

Scanning probe control process

Particular movement or positioning of scanning tip

For detection of specific nanostructure sample or nanostructure-related property

Biological sample

Semiconductor sample

For manufacture of nanostructure

Including etching/cutting

Including coating

Including positioning/mounting nanostructure

Including substrate treatment

Scanning probe structure

Scanning tunneling probe

Near-field probe

Atomic force probe

Electrostatic force probe

Magnetic force probe

Scanning capacitance probe

Scanning thermal probe

With optical means

Optical microscope

Optical lever arm for reflecting light

...With environmental regulation means

...Positioner

...Tip holder

...Probe tip array

...With tip detail

...Nanotube tip

...Chemically functionalized

...Shape/taper

...Material

...With arrangement, process, or apparatus for testing

...Microscopy or spectroscopy (e.g., SEM, TEM, etc.)

...Assembling of separate components (e.g., by attaching, etc.)

...Fluidic self-assembly ("FSA")

...Assembled via biorecognition entity

...Via nucleic acid hybridization

...Via protein recognition

...Nanoinprint lithography (i.e., nanostamp)

...Shaping or removal of materials (e.g., etching, etc.)

...By laser ablation

...Deposition of materials (e.g., coating, CVD, or ALD, etc.)

...Vapor phase deposition

...Liquid phase deposition

...Deposition in pores (molding) with subsequent removal of mold

...Having step or means utilizing biological growth

...Having step or means utilizing chemical property

...Chemical synthesis (e.g., chemical bonding or breaking, etc.)

...Polymerization

...Enzymatic

...Electrolytic

...Having step or means utilizing mechanical or thermal property (e.g., pressure, heat, etc.)

...Having step or means utilizing electromagnetic property (e.g., optical, x-ray, electron beam, etc.)

SPECIFIED USE OF NANOSTRUCTURE

For conversion, containment, or destruction of hazardous material
For medical, immunological, body treatment, or diagnosis

Specially adapted for travel through blood circulatory system

Drug delivery

Liposome

Mechanical repair performed/surgical

Obstruction removal

Strengthening cell or tissue

Cancer cell destruction

Cancer cell repair

Stem cell therapy implantation

Protein engineering

Therapeutic or pharmaceutical composition

Gene therapy

Vaccine

Immunological

Dental

Detection of biochemical

Toxic chemical

Explosive material

Cell culture

Using nanostructure as support of DNA analysis

Bioelectrical

Topical chemical (e.g., cosmetic or sunscreen, etc.)

Diagnostic contrast agent

X-ray agent

Ultrasound contrast agent

MRI contrast agent

Medical device coating

For electronic or optoelectronic application

Spintronics or quantum computing

Giant magnetoresistance (GMR)

Spin dependent tunnel (SDT) junction (e.g., tunneling magnetoresistance (TMR), etc.)

In a transistor or 3-terminal device

Single electron transistor

Field Effect transistors (FETs) with nanowire- or nanotube-channel region

Electron emitter (e.g., Spindt emitter tip coated with nanoparticles, etc.)

In a logic circuit

Including DNA logic element

Including Protein logic element

Information storage or retrieval using nanostructure

Biochemical memory

Protein memory

Nucleic acid memory

With scanning probe instrument

Energy storage/generating using nanostructure (e.g., fuel cell, battery, etc.)

Radiation emitter using nanostructure

Electromagnetic energy

Laser

Display

Detector using nanostructure

Of radiant energy

Of thermal property

Of mechanical property

Of chemical property or presence

Of biomolecule property

Of disease state

Of magnetic property

For textile or fabric treatment

For carrying or transporting