**18.** The photoelectric device of claim **11** wherein said quantum dot core is a metal sulfide colloidal quantum dot, said cations of said first shell are $Cd^{2+}$, and said anions of said second shell are bromine ions.

**19.** The photoelectric device of claim **1** wherein said light-transmitting first electrode is a member selected from the group consisting of aluminum oxide, zinc oxide, indium tin oxide, and fluorine-doped tin oxide.

**20.** The photoelectric device of claim **1** wherein said light-transmitting first electrode is fluorine-doped tin oxide.

**21.** The photoelectric device of claim **1** wherein said second electrode is a member selected from the group consisting of nickel, lithium fluoride, platinum, palladium, silver, gold, copper, and alloys of silver, gold, and copper.

**22.** The photoelectric device of claim **1** wherein said second electrode is gold.

**23.** A nanoparticle comprising:

a quantum dot core;

a first shell ~~comprising~~ consisting essentially of cations that substantially surround said quantum dot core; and

a second shell ~~comprising~~ consisting essentially of anions that substantially surround said first shell, wherein the ratio of anions to cations is approximately 1:1.

**24.** The nanoparticle of claim **23** wherein said quantum dot core is a metal chalcogenide colloidal quantum dot.

**25.** The nanoparticle of claim **23** wherein said quantum dot core is a metal sulfide colloidal quantum dot.

**26.** The nanoparticle of claim **23** wherein said quantum dot core is a metal sulfide colloidal quantum dot and said cations of said first shell are a member selected from the group consisting of $Cd^{2+}$, $Pb^{2+}$, $Zn^{2+}$, and $Sn^{2+}$.

**27.** The nanoparticle of claim **23** wherein said quantum dot core is a metal sulfide colloidal quantum dot and said cations of said first shell are $Cd^{2+}$.

**28.** The nanoparticle of claim **23** wherein said quantum dot core is a metal sulfide colloidal quantum dot and said cations of said first shell are $Cd^{2+}$ and said anions of said second shell are a member selected from the group consisting of halogen ions and thiocyanate ion.

**29.** The nanoparticle of claim **23** wherein said quantum dot core is a metal sulfide colloidal quantum dot, said cations of said first shell are $Cd^{2+}$, and said anions of said second shell are halogen ions.

**30.** The nanoparticle of claim **23** wherein said quantum dot core is a metal sulfide colloidal quantum dot, said cations of said first shell are $Cd^{2+}$, and said anions of said second shell are bromine ions.

**31.** A photoelectric device comprising:

a light-transmitting first electrode,

a first semiconductor layer in direct electrical contact with said first electrode,

a second semiconductor layer in direct electrical contact with said first semiconductor layer and comprising light-absorbing nanoparticles, each said nanoparticle comprising a quantum dot core, a first shell ~~comprising~~ consisting essentially of cations that substantially surround said quantum dot core, and a second shell ~~comprising~~ consisting essentially of anions that substantially surround said first shell, wherein the ratio of anions to cations is approximately 1:1, and

a second electrode in direct electrical contact with said second semiconductor layer.

**32.** The photoelectric device of claim **31** wherein said quantum dot core is a metal chalcogenide colloidal quantum dot.

**33.** The photoelectric device of claim **31** wherein said quantum dot core is a metal sulfide colloidal quantum dot.

**34.** The photoelectric device of claim **31** wherein said quantum dot core is a metal sulfide colloidal quantum dot and said cations of said first shell are a member selected from the group consisting of $Cd^{2+}$, $Pb^{2+}$, $Zn^{2+}$, and $Sn^{2+}$.

**35.** The photoelectric device of claim **31** wherein said quantum dot core is a metal sulfide colloidal quantum dot and said cations of said first shell are $Cd^{2+}$.

**36.** The photoelectric device of claim **31** wherein said cations of said first shell are $Cd^{2+}$ and said anions of said second shell are a member selected from the group consisting of halogen ions and thiocyanate ion.

**37.** The photoelectric device of claim **31** wherein said quantum dot core is a metal sulfide colloidal quantum dot, said cations of said first shell are $Cd^{2+}$, and said anions of said second shell are halogen ions.

**38.** The photoelectric device of claim **31** wherein said quantum dot core is a metal sulfide colloidal quantum dot, said cations of said first shell are $Cd^{2+}$, and said anions of said second shell are bromine ions.

**39.** The photoelectric device of claim **31** wherein said first semiconductor layer is titanium dioxide.

**40.** The photoelectric device of claim **31** wherein said light-transmitting first electrode is a member selected from the group consisting of aluminum oxide, zinc oxide, indium tin oxide, and fluorine-doped tin oxide, and said second electrode is a member selected from the group consisting of nickel, lithium fluoride, platinum, palladium, silver, gold, copper, and alloys of silver, gold, and copper.

**41.** The photoelectric device of claim **31** wherein said light-transmitting first electrode is fluorine-doped tin oxide, and said second electrode is gold.

**42.** A method of forming passivated p-type semiconductor nanoparticles, said method comprising:

(a) treating p-type semiconductor colloidal quantum dots having surface anions with a solution of a cation-containing reagent that passivates said surface anions to form colloidal quantum dots coated with a first shell consisting essentially of said cations, and

(b) treating said colloidal quantum dots so coated with a solution of an anion-containing reagent that passivates said cations to form a second shell consisting essentially of said passivating anions, wherein the ratio of passivating anions to cations is approximately 1:1.

**43.** The method of claim **42** said p-type semiconductor colloidal quantum dots are metal chalcogenide colloidal quantum dots.

**44.** The method of claim **42** said p-type semiconductor colloidal quantum dots are metal sulfide colloidal quantum dots.

**45.** The method of claim **42** said p-type semiconductor colloidal quantum dots are lead sulfide colloidal quantum dots.

**46.** The method of claim **42** said cation of said cation-containing reagent is a member selected from the group consisting of $Cd^{2+}$, $Pb^{2+}$, $Zn^{2+}$, and $Sn^{2+}$.

**47.** The method of claim **42** said cation of said cation-containing reagent is $Cd^{2+}$.

**48.** The method of claim **42** said anion of said anion-containing reagent is a member selected from the group consisting of halogen ions and thiocyanate ion.

**49.** The method of claim **42** said cation-containing reagent is cadmium(II) chloride-tetradecylphosphonic acid-oleylamine.

**50.** The method of claim **42** said anion of said anion-containing reagent is a member selected from the group consisting of halogen ions and thiocyanate ion.

**51.** The method of claim **42** said anion of said anion-containing reagent is a halogen ion.

**52.** The method of claim **42** said anion of said anion-containing reagent is a bromine ion

**53.** The method of claim **42** said anion-containing reagent is a member selected from the group consisting of cetyltrimethylammonium bromide, hexatrimethylammonium chloride, tetrabutylammonium iodide, and tetrabutylammonium thiocyanate.