CLAIMS

What is claimed is the following:

1. A process comprising:

reacting an insoluble complex of a metal salt with a reducing agent in a reaction mixture comprising a first surfactant, a second surfactant, and a third surfactant so as to form metal nanoparticles;

wherein the first surfactant comprises a primary amine, the second surfactant comprises a secondary amine, and the third surfactant comprises a chelating agent comprising an ~~diamine~~ N,N'-dialkylethylenediamine.

2. The process of claim 1, wherein the metal nanoparticles comprise copper nanoparticles.

3. The process of claim 1, wherein the insoluble complex comprises a coordination compound of the metal salt with at least one of the first surfactant, the second surfactant, and the third surfactant.

4. The process of claim 1, wherein the reaction mixture is substantially oxygen free.

5. The process of claim 1, further comprising:

after forming the metal nanoparticles, quenching the reducing agent with a terminating agent that is reactive therewith.

6. The process of claim 5, wherein the terminating agent is selected from the group consisting of an aldehyde, a nitrile, an organic acid, water, and combinations thereof.

7. The process of claim 1, further comprising:

arresting the formation of the metal nanoparticles by performing an action selected from the group consisting of adding a terminating agent to the reaction mixture, cooling the reaction mixture to about -10°C or below, centrifuging the reaction mixture, and combinations thereof.

8. The process of claim 1, further comprising:

isolating the metal nanoparticles from the reaction mixture.

9. The process of claim 1, wherein the reaction mixture further comprises an organic solvent.

10. The process of claim 9, wherein the organic solvent comprises diglyme or triglyme.

11. The process of claim 1, wherein reacting takes place at a temperature ranging between about 0°C and about 50°C.

12. The process of claim 1, wherein the insoluble complex is formed at a temperature of at most about 85°C.

13. The process of claim 1, wherein the reducing agent comprises $NaBH_4$.

14. The process of claim 1, wherein the metal nanoparticles range from about 3 nm to about 6 nm in size.

15. The process of claim 1, wherein the reaction mixture comprises about 1 part of the first surfactant, about 2 parts of the second surfactant, and about 1 part of the third surfactant.

16. A process comprising:

forming a first solution comprising a copper salt, a first surfactant, a second surfactant, and third surfactant;

wherein the first surfactant comprises a primary amine, the second surfactant comprises a secondary amine, and the third surfactant comprises a chelating agent comprising an N,N'-dialkylethylenediamine~~diamine~~;

allowing an insoluble complex of the copper salt to form from the first solution;

combining a second solution comprising a reducing agent with the insoluble complex, thereby forming a reaction mixture; and

forming copper nanoparticles from the insoluble complex.