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Huber

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(54) **MAGNETIC AGGLOMERATION METHOD FOR SIZE CONTROL IN THE SYNTHESIS OF MAGNETIC NANOPARTICLES**

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(52) **U.S. Cl.** **75/347; 75/371; 977/896**

(58) **Field of Classification Search** **75/347, 75/371; 977/896**

See application file for complete search history.

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(57) **ABSTRACT**

A method for controlling the size of chemically synthesized magnetic nanoparticles that employs magnetic interaction between particles to control particle size and does not rely on conventional kinetic control of the reaction to control particle size. The particles are caused to reversibly agglomerate and precipitate from solution; the size at which this occurs can be well controlled to provide a very narrow particle size distribution. The size of particles is controllable by the size of the surfactant employed in the process; controlling the size of the surfactant allows magnetic control of the agglomeration and precipitation processes. Agglomeration is used to effectively stop particle growth to provide a very narrow range of particle sizes.

19 Claims, 12 Drawing Sheets

