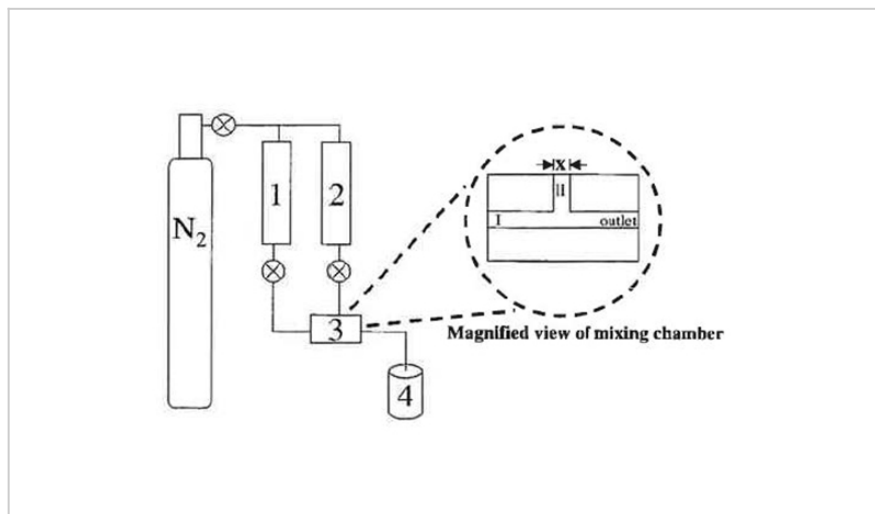


# A Novel System for Separating Nanoparticles from By-Products

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Schematic of double injection system

## Technology Summary

The present invention is a system for generating nano-sized particles through vigorous mixing in a double injection apparatus to form nanoparticles within an aqueous solution. Surfactant(s) added to the nanoparticle solution immediately form a hydrophobic coating, preventing agglomeration and Ostwald coarsening of the particles. Mixing the nanoparticle aqueous solution with an immiscible nonpolar solvent such as toluene or octane forms an unstable emulsion, which then settles into two immiscible phases. The salts and many of the by-products remain in the aqueous phase for easy removal of the undesirable components. The nanoparticles with a hydrophobic coating are extracted into the nonpolar solvent phase while the aqueous by-products are left inside the aqueous phase. The nanoparticle-containing phase is separated from the aqueous phase by a separation funnel or similar easy to use approaches. From this point nanoparticles can be manipulated, allowing for changes in crystallinity and composition.

## Application & Market Utility

The present invention offers an easy and quick solid-liquid separation using evaporation of organic solvent. The system reduces opportunities for decomposition and agglomeration of nanoparticles. The system is applicable to many nanoparticle systems. The processing times are quick and the production costs are reduced.

## Next Steps

Patent issued 1/15/2008. Seeking commercialization.

TECHNOLOGY READINESS LEVEL

1-3

### Seeking

Investment | Licensing | Research

### Keywords

- Nanoparticles
- capacitors
- double injection
- solid-liquid separation

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