



# Selenium Nanoparticles Synthesis (20150326, Dr. Abdenmour Abbas)

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## Category

Engineering & Physical  
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## Selenium Nanoparticles

Selenium nanospheres are synthesized quickly and inexpensively by combining aqueous solutions of selenous acid and a reducing agent in the presence of a surface capable of providing nucleation sites under conditions effective to form selenium nanomaterials. The process produces selenium particles that are either bound or unbound, and the properties of the selenium layer can be modified under different reaction conditions. The method can produce monodisperse nanostructures in a variety of shapes, including nanoparticles, microspheres, nanodomes and thin nanoselenium films.

## Mercury Removal, Antimicrobial and Photosensor Applications

The nanoparticles effectively remove mercury from air, gas and water, and also demonstrate strong antimicrobial tendency, making them ideal for surface cleaning, mold prevention and coating medical devices or surfaces. The optoelectric properties of selenium nanoparticles could be useful in fabricating solar cells, photosensor detectors and photocopiers. Bioprotective activity such as nephroprotection has been demonstrated, as has antitumor activity: selenium nanoparticles could be used to induce apoptosis in cancer tumors.

## BENEFITS AND FEATURES OF SELENIUM NANOPARTICLES:

- Antimicrobial—ideal for cleaning, mold prevention and medical devices
- Simple and inexpensive to manufacture
- Method produces bound or unbound nanoparticles
- Removes mercury from water
- Produces monodisperse nanostructures in a variety of shapes
- Beneficial optoelectric and bioprotective properties
- Cancer treatment: can induce apoptosis in cancer tumors

**Phase of Development** Proof of concept

## Researchers

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