

## A review on radiation-induced nucleation and growth of colloidal metallic nanoparticles

### ABSTRACT

This review presents an introduction to the synthesis of metallic nanoparticles by radiation-induced method, especially gamma irradiation. This method offers some benefits over the conventional methods because it provides fully reduced and highly pure nanoparticles free from by-products or chemical reducing agents, and is capable of controlling the particle size and structure. The nucleation and growth mechanism of metallic nanoparticles are also discussed. The competition between nucleation and growth process in the formation of nanoparticles can determine the size of nanoparticles which is influenced by certain parameters such as the choice of solvents and stabilizer, the precursor to stabilizer ratio, pH during synthesis, and absorbed dose.

**Keyword:** Growth; Metallic nanoparticles; Nucleation; Radiation-induced method; Redox potential