

## Synthesis of Metal Nanoparticles in Solutions by $\gamma$ -ray Illumination and Their Physical Properties

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In recent years, metal nanoparticles have been actively studied because of their various potential applications including biomedical uses such as cell and DNA separation and drug delivery systems [1, 2].

One of the methods for synthesizing metal nanoparticles in solution is to use photon illumination. By applying photons in solutions containing metal precursors, they are likely to be easily reduced to their neutral atoms. The reduced atoms form clusters, finally generating nanosized particles. Recently, some research groups succeeded in synthesizing metal nanoparticles using  $\gamma$ -ray, which is one of high energy photons [3, 4].

In this work, we tried to synthesize metal nanoparticles including Pt and Au by  $\gamma$ -ray illumination. By changing the precursor contents in solution, intensity and exposed time of  $\gamma$ -ray, etc, different sizes and shapes of metal nanoparticles were obtained. The key processing parameters determining their growth behavior will be discussed.

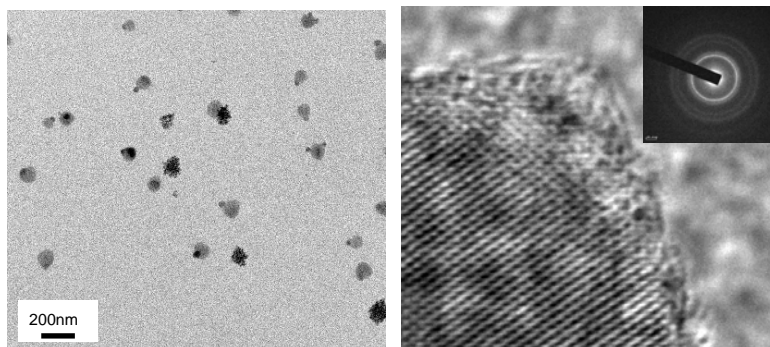
### References:

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- [2] S. Seino, T. Kusunose and T. Sekino, *J. Appl. Phys.*, **99** (2006).
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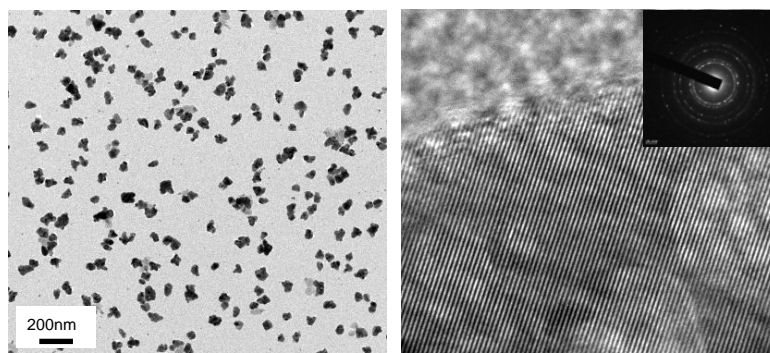
### Acknowledgement:

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### Figure :



**Figure 1 :** Transmission electron micrographs of Pt nanoparticles synthesized by  $\gamma$ -ray illumination.



**Figure 2 :** Transmission electron micrographs of Au nanoparticles synthesized by  $\gamma$ -ray illumination.