

Thermal Plasma Synthesis of Ce:YAG Nanoparticles

Ricky Jain, Steven L. Girshick (PI), J.V.R. Heberlein (PI)

Mechanical Engineering, University of Minnesota

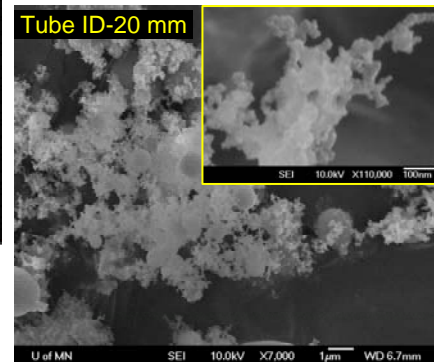
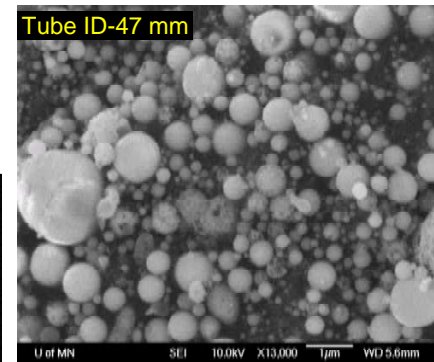
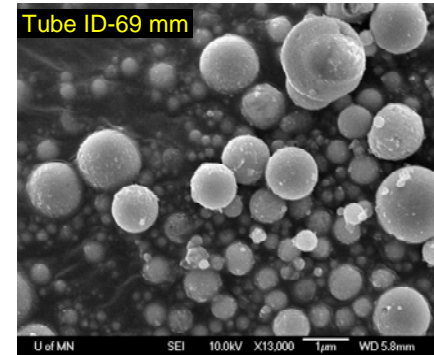
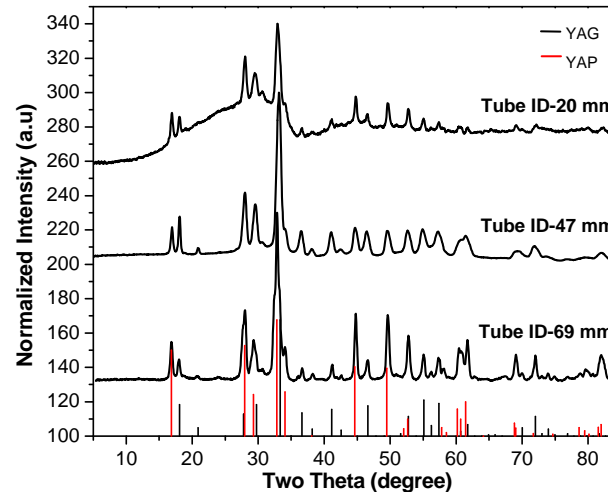
NNIN Facility utilized: CharFac JEOL6500

DESCRIPTION OF WORK

- ◆ Synthesize Ce-doped YAG nanoparticles directly through a radio-frequency thermal plasma system
- ◆ Control size and phase of nanoparticles during synthesis through insertion of ceramic tube in reactor

MAJOR OBSERVATIONS

- ◆ Inserting ceramic tube helps to control the phase through in-flight annealing and size-selective collection
- ◆ Optimal tube size exists for best annealing performance
- ◆ Reducing tube size reduces average particle size as indicated by SEM and BET measurements



- *Publication: Jain, R.; Girshick, S. L.; Heberlein, J. V.; Mukherjee, R.; Zhang, B.; Nakamura, T.; Mochizuki, A. *Plasma Chem. Plasma Process.* (2010), 30, 795-811