

**STRUCTURAL AND SPECTROSCOPICAL
CHARACTERIZATION OF RE³⁺ (RE = Er, Eu, Tb)
DOPED NANOCRYSTALLINE YAG/YVO₄
PRODUCED BY A SOL-GEL METHOD/
PRECIPITATION METHOD**

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Nanocrystalline YAG powders doped with Er³⁺, Eu³⁺ or Tb³⁺ were synthesized through a citrate-nitrate sol-gel process and Eu:YVO₄ nanocrystals were synthesized by direct precipitation method

Thermal treatments were applied at successively increasing temperatures in the interval 600- 1400°C. The structural transformations were monitored by X-ray diffraction - XRD, FT-IR and optical spectroscopy. A pure garnet phase was observed for annealing temperatures higher than 930°C for YAG:RE. The XRD and spectroscopic measurements show the presence of only the orthovanadate phase. A significant increase of the luminescence intensity with thermal treatment was observed for both RE doped samples.

Key words: nanocrystals, YAG, YVO₄, Eu³⁺, Er³⁺, Tb³⁺, sol-gel method, precipitation method