Sol-gel Synthesis and Study of $LaPO_4$ Doped with Cerium(III) and Ytterbium(III) thin Films

<u>Abdolali Alemi</u>, Babak Golzadeh, *Department of Inorganic Chemistry, Faculty of Chemistry, Tabriz University, Tabriz, Iran.* E-mail: aa_alemi@yahoo.com

In this research nanocrystalline thin films of Lanthanium phosphate doped with cerium(III) and ytterbium(III) were prepared.

Lanthanium oxide reacted with hexa hydrated cerium nitrate or ytterbium oxide dissolved in nitric acid and mixed with chelating agent for the metal ions (i.e. water-ethanol solution containing citric acid). The required amount of Poly ethylene glycole (PEG) as cross-linking agent and diamonium hydrogen phosphate were also added using a sol-gel method. The product was then dried on silica glass substrate. Heating on dried films for 5 hours in the temperature range of 800-1000°C results in formation of Lanthanium phosphate doped with cerium(III) and ytterbium(III). X-ray diffraction (XRD) and FT-IR spectroscopy, SEM and Fluorimetrie of doped lantanium phosphates were presented.

 Robertson J.M., et al., *Appl. Phys. Lett.*, 1980, **37**, 471. [2] Alemi A.A., Shirazi S., *Iranian J. of Cryst. and Mineralogy*, 1994, **2**, 109. [3] Lin L., Saenger D.U., et al., *Thin Solid Films*, 2000, **360**, 39. [4] Yu M., Lin J., Fu L., Wang S., *J. Mater. Chem.*, 2002, **12**, 86. [5] Meng Q., Lin J., Fu L., Zhang H., *J. Mater. Chem.*, 2001, **11**, 3382. [6]Rao R.P., *Solid State Commun.*, 1996, **99**, 439.

Keywords: sol-gel, lanthanium phosphate, cerium and ytterbium