International Journal of ChemTech Research
CODEN (USA): IJCRGG, ISSN: 0974-4290, ISSN(Online):2455-9555
Vol.9, No.06 pp 514-523, 2016

# Synthesis and characterization of nano-sized hydroxyapatite and doped with some rare earth elements from phosphogypsum waste

**Adly A.Hanna[1], Sahar M.Mousa[1,3], Marwa A.Sherief[1]*, Gehan M.Elkomy[2]**

**[1]Inorganic Chemistry Department,**
**[2]Electron Microscope and thin films, physics Department, National Research Centre, 33 Elbohooth St.(Tahrir) Dokki, P.O.Box: 12622, Postal code: 11787, Giza, Egypt,**
**[3]Chemistry Department, King Abdulaziz University, Science & Art College, Rabigh Campus, P.O. Box: 344, Postal code: 21911 Rabigh, Saudi Arabia.**

**Abstract :** Phosphogypsum (PG)derived from the manufacturing of phosphoric acid by wet process method was converted to nano-particle hydroxyapatite (HAP). Also, the effects of the calcination temperature and the doping with some rare earth elements (La and/or Ce) on the structure of the produced HAP particles were studied. The produced samples were characterized by scanning electron microscope (SEM), Transmission electron microscope (TEM), IR absorption, X-ray diffraction and the thermogravimetric analysis (DTA&DTG).The results of characterization show that PG converted to nano-particle HAP and crystalize in the form of hexagonal structure. The crystalline formation increased by heat treatment up to 900° C. Also, it is found that the doping with different percentage of La or Ce improved the crystallinity of the doped hydroxyapatite. The thermogravimeter analysis shows that the doping of HAP increases the thermal stability and other produced samples and the doped and undoped samples are thermally stable up to 1000 °C.

**Adly A.Hanna *et al* /**International Journal of ChemTech Research, 2016,9(6),pp 514-523.

*****