

15th Annual Congress on

MATERIALS RESEARCH & TECHNOLOGY

February 19-20, 2018 | Paris, France

Elaboration and structural characterization of new materials of KDP-Family

Rawdha Dekhili^{1, 2, 3, 4}, Thomas H Kauffmann^{1, 2}, Hassen Aroui⁴ and Marc D Fontana^{1, 2}¹Universite de Lorraine, France²CentraleSupélec, France³Universite de Tunis El Manar, Tunisia⁴Universite de Tunis, Tunisia

Many studies are devoted to the family of compounds of formula MX_2RO_4 ($M=K, Rb, NH_4, Cs, Tl, X=H, D, R=P, As$). Among these compounds, KDP is the most known material owing to many physical and chemical properties used for applications in non-linear optics, ferro-electricity piezoelectricity and electro-optics. Here our interest concerns new materials of this family: LiH_2PO_4 (LDP) and $KLi(H_2PO_4)_2$ (KLDLP). A few data were only reported on these materials. We more deeply investigate their structural, vibrational and optical properties. The KLDLP and LDP compounds were synthesized by slow evaporation method and their crystal structure was determined at room temperature by X-ray diffraction. KLDLP crystal belongs to the $P21/c$ ($C2h$) space group of the monoclinic system whereas LDP crystal has the orthorhombic structure with the space group $Pna21-C2v$. The structures constitute on PO_4 and LiO_4 tetrahedra interconnected by oxygen atoms, to form a tridimensional network. Furthermore, the hydrogen bonds types consolidate the structure. The vibrational properties of LDP and KLDLP crystals have been investigated at room temperature by means of Raman spectroscopy. The analysis of spectra revealed tetrahedrons PO_4 and LiO_4 vibration internal modes, stretching and bending OH modes. The results were confirmed by the DFT calculations. Raman measurements as a function of temperature and differential scanning calorimetry evidenced phase transition temperatures.

Biography

Rawdha Dekhili is currently pursuing his PhD in Chemistry at Universite de Lorraine, France and is affiliated to Centrale Supélec, France, Universite de Tunis El Manar, Tunisia and Universite de Tunis, Tunisia

rawdhadekhiliichimiste@gmail.com

Notes: