CHARACTERIZATION OF PIEZOELECTRIC CERAMICS OBTAINED BY SOLID METHOD

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Abstract : The purpose of this work is to investigate the structural properties of ceramics obtained by conventional solid method. The powders of composition (98 mol% ZnO + 2 mol% TiO2) were activated mechanically in a planetary ball mill for 180 min. The powders were compacted into pellets and sintered at temperature of 1100 ° C for 240 min.The microstructural transformations have been characterized by X-ray diffraction, Fourier transform FT-IR and Raman spectroscopy.The structure parameters namely: lattice parameter, micro strains, crystallite size and the relative proportions of the phases have been studied by the Rietveld refinement method using the MAUD program.The results of X-ray revealed that the sintering treatment ensured the presence of ZnO as a main phase and a trace of r-TiO2. It should also be noted the formation of a new phase Zn2TiO4 (spinel) as a secondary phase with low proportions. The slight increase in lattice parameters "a" and "c" of the existing phases compared to ISCD sheets was explained by distortion or presence of defects such as: dislocations. Raman spectroscopy and Fourier transform FT-IR confirmed the results of X-ray Obtained.

Keywords : ZnO-TiO2 System, ceramic, Piezoelectric, Mechanical milling, Sintering, microstructure