

## Mechanical alloying of PBN

*Arantes, V.L., Cardoso, K.R., Souza, D.F.S., Silva, A. A., Crochemore, G. B.*  
(1) UNIVAP, (2) UFSCar

The process of mechanical alloying, developed initially for production of nickel-based alloys hardened by oxides dispersion, have been very adequate for development of new materials and more traditional ones with new properties. Furthermore, this technique allows obtaining nanomaterials, which has revolutionized the basic materials science and improved mechanical and magnetic properties of metallic alloys. Lead barium niobate solutions  $(\text{Pb}_{1-x}\text{Ba})\text{Nb}_2\text{O}_6$  is a promising ceramic material for use in piezoelectric and electro-optic devices, such as in memory applications and holographic data storage. This solid solution is ferroelectric and have a tungsten bronze structure with a typical morphotropic phase boundary, which separates a tetragonal phase  $4mm$  and an orthorhombic  $m2m$ . Nearby this region, PBN shows extraordinary electro-optic, piezoelectric and pyroelectric properties. Besides being influenced by the composition, these properties depend on processing conditions, which determine the density, grain size, stoichiometry, magnitude of internal stresses and presence of second phases. This work focused on the utilization of mechanochemical synthesis as a method of synthesis of PBN nearby morphotropic phase boundary without loss of lead. The powders obtained were characterized by X-Rays diffraction, DSC and scanning electronic microscopy.

### Palavras-Chave:

PBN, high-energy ball milling,