

Study of Processing and Sintering of PZT-NAVY Type II Piezoelectric Ceramics from Brazilian Raw Materials

Edmar Magalhes

BRAZILIAN NAVY RESEARCH INSTITUTE - BRAZIL

Abstract

The aim of this work was the study of the processing and the ideal sintering conditions of lead zirconate titanate (PZT), synthesized by the mixing oxide route using brazilian raw materials. Niobium pentoxide was used as the doping agent in order to obtain eletroceramic material having the characteristics of the PZT NAVY Type II. It was observed a higher apparent densification at lower temperatures, for the ceramic pieces, than that usually expected for this kind of material. The dielectric and piezoelectric properties were evaluated as a function of the sintering temperature. The properties of the samples having higher densification are in good agreement to the values listed in the military standards , to be used as electroacoustic transducers. The same methodology for the production of these powders was repeated by two other research centers, using different raw materials, in order to confirm the reproducibility of the results. Further processing led to similar results regardless the raw materials source, showing that niobium was the main responsible for the decrease in the sintering temperature. It was also shown that brazilian precursors can be used to prepare chemically dense and stable piezoceramics having properties according to military standards specification.