

# **The Cold Sintering of Lead Zirconate Titanate (PZT-5A) Powder**

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This paper demonstrates that lead zirconate titanate can be cold sintered to ~ 97% density. Lead zirconate titanate (PZT-5A) powder was mixed with a PZT hydrothermal solution (0.5 mol/L  $\text{Pb}(\text{NO}_3)_2$  in deionized water) and cold sintered into pellets in a uniaxial press under a pressure of 500 MPa at 300 °C for 3 hours. The as-sintered pellet presented a dielectric permittivity ~ 200 and a loss tangent ~ 2% at 1 MHz under room temperature. After being fired in air at 900 °C for 3 hours, the pellet showed a dielectric permittivity ~ 1,400 and a loss tangent ~ 4% at 1 MHz under room temperature, yielding a relative density of ~98% based on Lichterecker logarithmic mixing rule. The phase purity of the pellets have been verified by the X-ray diffraction (XRD) that no secondary phase can be observed.