

**Low temperature sintering of the binary complex perovskite oxide (x)  
Ba(Zn<sub>1/3</sub>Ta<sub>2/3</sub>)O<sub>3</sub> + (1-x) Ba(Mg<sub>1/3</sub>Ta<sub>2/3</sub>)O<sub>3</sub>**

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**Abstract**

The interest for the complex perovskites oxides is known since several years. Ba(Zn<sub>1/3</sub>Ta<sub>2/3</sub>)O<sub>3</sub> (BZT) and Ba(Mg<sub>1/3</sub>Ta<sub>2/3</sub>)O<sub>3</sub> (BMT) have been broadly studied due to their attractive dielectric properties suitable for applications such as multilayer ceramic capacitors or hyperfrequency resonators. They hence exhibit at 1 MHz very low dielectric losses combined with a high relative dielectric constant which is stable with the temperature. Several complex formulations (x) Ba(Zn<sub>1/3</sub>Ta<sub>2/3</sub>)O<sub>3</sub> + (1-x) Ba(Mg<sub>1/3</sub>Ta<sub>2/3</sub>)O<sub>3</sub> (with x=0, 1/3, 1/2, 2/3 and 1) have been processed by conventional solid state method to investigate dielectric properties as a function of x. Unfortunately, these materials needs a too high temperature to reach a satisfying density. The BMT sintering temperature is indeed higher than 1500°C, which is too high to envisage a co-sintering with copper (T<sub>f</sub>=1083°C) or nickel (T<sub>f</sub>=1450°C). For this goal, a glass phase addition is performed on the complex formulations. The sintering temperature lowering reached is higher than 400°C when 10 molar % of borate oxide is added to the complex formulations and the dielectric properties of the solid solution obtained are very attractive (=25 and =-59 ppm/°C for x=1/3) for the fabrication of Base Metal Electrodes Multi Layer Ceramic Capacitors (BME-MLCC).