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标题: Low temperature cofirable Ca[(Li1/3Nb2/3)(0.95)Zr-0.15]O3+delta microwave dielectric ceramic with ZnO-B2O3-SiO2 frit
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摘要: The sintering properties and microwave dielectric properties of Ca[Li1/3Nb2/3)(1-x)Zr-3x]O3+delta(x = 0.05, abbreviated as CLNZ) ceramic doped with ZBS frit are investigated for LTCC applications. XRD patterns and SEM photographs show that dense and single perovskite phase ceramics can be obtained with ZBS doping content of less than 10 wt%, before the Ca2Nb2O7 pyrochlore phase begins to segregates. The results show that ZBS vitreous phase stays at the grain boundary in the final sintered ceramics, suggesting it acts as liquid phase lubrication during sintering, and has effectively lowered the sintering temperature of CLNZ ceramics from 1170 degrees C to 940 degrees C. The preferred orientation of CLNZ solid solution varies from (1 2 1) plane to (1 0 1) plane as ZBS content and sintering temperature increase. The optimal microwave dielectric properties of epsilon(r) = 32.0, Q(f) = 6.64 THz and tau(f) = 27.1 ppm/degrees C can be obtained in 15 wt% ZBS doped CLNZ ceramic when sintered at 940 degrees C for 4 h. The Ag-cofiring experiment clearly shows that no chemical reaction takes place between Ag and the ZBS-doped CLNZ ceramic, indicating its great potential applications in LTCC field. 
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