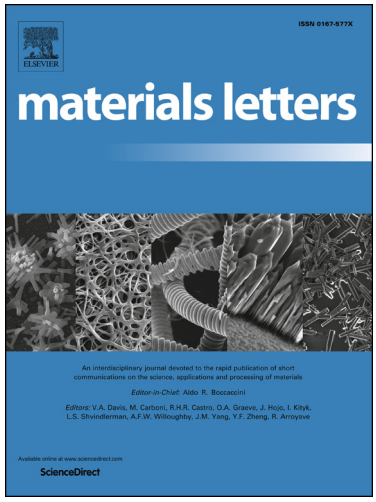

A spinel-related solid solution ceramic $0.7LiFe_5O_8$-$0.3Li_2MgTi_3O_8$ with high permeability and excellent microwave dielectric properties

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A spinel-related solid solution ceramic $0.7LiFe_5O_8$-$0.3Li_2MgTi_3O_8$ with high permeability and excellent microwave dielectric properties

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Abstract A spinel phase solid solution ceramic material of $0.7LiFe_5O_8$-$0.3Li_2MgTi_3O_8$ has been synthesized by a solid-state reaction method. The crystal structure, sintering behaviors, microstructures, magnetic properties and dielectric properties were investigated. The sample sintered at 1050°C for 2 h possesses good magnetic properties with an initial permeability of 20.8, a cut-off frequency up to 60 MHz, and a high saturation magnetization value of 33emu/g. Furthermore, this material shows excellent microwave dielectric properties, with ε' value of 15.7 and a high quality factor (Q×f) about 15700 GHz (at 8.16 GHz). This multifunctional ceramic combines both excellent magnetic and dielectric performance is very useful in the design of novel multifunctional electronic devices.

Introduction Miniaturization and integration are the developing trend of electric products in current world [1]. Therefore, the multi-functional electronic materials especially the magneto-dielectric materials with high performance and low loss have received much attention for their important use in making the electronic devices tiny, smart and multifunctional [2, 3]. In general, the composite method is relatively easy to make multiphase magneto-dielectric composite with comprehensive performance, and

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