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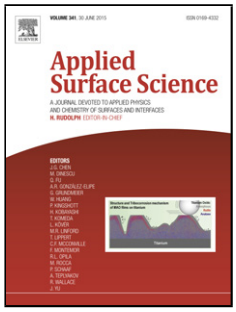

Title: Concentrated solar energy used for sintering magnesium titanates for electronic applications

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Concentrated solar energy used for sintering magnesium titanates for electronic applications

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Highlights

- Different ratios of MgO/ TiO_2 ceramics were prepared by solid state reaction technique.
- The compositions were $(MgO)_{0.52}(TiO_2)_{0.30}$, $(MgO)_{0.40}(TiO_2)_{0.41}$,and $(MgO)_{0.50}(TiO_2)_{0.50}$
- We sintered $(MgO)_{0.52}(TiO_2)_{0.30}$, $(MgO)_{0.40}(TiO_2)_{0.41}$, $(MgO)_{0.50}(TiO_2)_{0.50}$ ceramics samples in air at about 1100°C for 1h, 2h and 3h in the solar furnace.
- The structure, microstructure and dielectric properties of the solar sintered samples were studies and is presented.

Abstract

Solar energy is an important renewable source of energy with many advantages: it is unlimited, clean and free. The main objective of this work was to sinter magnesium titanate ceramics in a solar furnace using concentrated solar energy, which is a novel and original process. The direct conversion of solar power into high temperature makes this process simple, feasible and ecologically viable/ environmentally sustainable. We performed the solar sintering experiments at Plataforma Solar de Almeria-CIEMAT, Spain. This process takes place in a vertical axis solar furnace (SF5-5kW) hosting a mobile flat mirror heliostat, a fixed parabolic mirror concentrator, an attenuator and a test table the concentrator focus. We sintered $(MgO)_{0.63}(TiO_2)_{0.37}$, $(MgO)_{0.49}(TiO_2)_{0.51}$, $(MgO)_{0.50}(TiO_2)_{0.50}$ ceramics samples in air at about 1100°C for a duration of 16 minutes, 1h, 2h and 3h in the solar furnace. The

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