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Giant dielectric constant in $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$ - MgB_2 composites near the percolation threshold RUPAM MUKHERJEE, Wayne State University, LUCIA FERNANDEZ, CINN Research Center on Nanomaterials and Nanotechnology, GAVIN LAWES, BORIS NADGORNYY, Wayne State University — We have investigated the enhancement of the dielectric constant K in $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$ (CCTO)- MgB_2 composite near the percolation threshold. To optimize the dielectric properties of pure CCTO we have sintered the samples at various temperatures. We will present the results of the measurements of K in a broad frequency for pure CCTO for the samples sintered at 1100°C and 500°C . Commercially available MgB_2 powder was mixed with different weight fractions of CCTO and the pressure of 1GPa was applied to form composite pellets. Near the percolation threshold P_C , CCTO/ MgB_2 composite system exhibit a dramatic increase of the dielectric constant K by several orders of magnitude, compared to pure CCTO. We will also discuss the magnetic field dependence of the capacitance of CCTO composite powders.

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