

Magnetic and magnetodielectric properties in frustrated $\text{Cu}_2\text{Te}_2\text{O}_5\text{Br}_2$

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An intriguing magnetodielectric behavior is observed in geometrically frustrated spin-tetrahedral system ($\text{Cu}_2\text{Te}_2\text{O}_5\text{Br}_2$). A strongly reduced magnetic transition temperature $T_N = 11.7$ K is found in comparison with a dominant magnetic exchange of 40 K. In the dielectric measurement, two main peaks are observed at around $T_1 \sim 40$ K and $T_2 \sim 80$ K. When applying magnetic field, both T_1 and T_2 decrease. The peak at T_1 might be due to the magnetic exchange interaction between Cu atoms. While, the peak at T_2 might be due to the ferroelectric phase transition, in which a remnant polarization is found to increase when temperature is lower than T_2 . The similar and different properties between $\text{Cu}_2\text{Te}_2\text{O}_5\text{Br}_2$ and its isostructural compounds are compared and discussed.