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## Magnetic and magnetocaloric properties of the ternary Cadmium based intermetallic compounds of $Gd_2Cu_2Cd$ and $Er_2Cu_2Cd$

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The magnetic properties, magnetocaloric effect (MCE) and universal behaviour of ternary Cadmium compounds  $Gd_2Cu_2Cd$  and  $Er_2Cu_2Cd$  have been investigated systematically. A second order magnetic phase transition from a paramagnetic to ferromagnetic state is observed for  $Gd_2Cu_2Cd$  and  $Er_2Cu_2Cd$  at their own Curie temperatures of  $T_C \sim 120$  and  $36$  K, respectively. A large reversible MCE occurs near its own  $T_C$  for both compounds. The maximum values of magnetic entropy change ( $-\Delta S_M^{\max}$ ) are  $10.1$  and  $19.1$  J/kg K under a magnetic field change of  $0-7$  T with no obviously hysteresis loss for  $Gd_2Cu_2Cd$  and  $Er_2Cu_2Cd$ , respectively. The corresponding values of refrigerant capacity ( $RC$ ) and relative cooling power ( $RCP$ ) are evaluated to be  $386$  and  $373$  J/kg, and to be  $525$  and  $489$  J/kg, respectively. The rescaled magnetic entropy change curves collapse onto a single curve for various magnetic fields, further confirming the  $Gd_2Cu_2Cd$  and  $Er_2Cu_2Cd$  compounds with the second order phase transition.

**Keywords:**  $Gd_2Cu_2Cd$  and  $Er_2Cu_2Cd$  compounds; Magnetic properties; Magnetocaloric effect; Magnetic phase transition.

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